

ANIMAL KEEPERS' FORUM



DECEMBER 2008

The Journal of the American
Association of Zoo Keepers, Inc.

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34th Anniversary - 1974 - 2008

MISSION STATEMENT

(Revised November 2008)

American Association of Zoo Keepers, Inc.

The mission of the American Association of Zoo Keepers, Inc. is to advance excellence in the zookeeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

This month's cover features a drawing of a Cinereous Vulture (Aegypius monachus) and its chick drawn by Elena Chelysheva, former curator at the Moscow Zoo. This species may be found in a band running from the mountainous areas of central Spain, east to northeast Mongolia, and into the Urals. It occasionally migrates in the winter to Sudan and tropical continental Asia, but is mainly a resident throughout its range. It prefers mountainous country, descending to the plains to feed, and has been sighted at altitudes up to 23,000 feet (7,000m) on Mt. Everest. As is common with all vultures, this species lives almost exclusively on carrion. Vultures do not have feet adapted for killing as they lack the sharp talons of other birds of prey, however they possess a beak like a bolt cutter. They also sometimes have been known to kill rodents and small mammals with their bills. Vultures are almost invariably quiet, if not silent birds and the Cinereous Vulture is no exception, confining its utterances to occasional croaks and hisses when at a carcass. During breeding season there are mewings as well as loud squalling and roaring. The young in the nest often utter guttural cries. Throughout its range, the Cinereous Vulture is mostly a solitary bird and quite uncommon. It may be seen in pairs or small groups. It takes wing as the air warms in the morning and soars continually until evening when it roosts in a tree. At a carcass it is usually alone or in a very small group. It is quarrelsome, but wary, and will move away to a high point after eating, rather than staying near the carcass. There are currently thought to be fewer than 4,000 Cinereous Vultures in the world. The primary threats to their survival come from two areas: 1) It is believed to be a pest by farmers and, despite its protected status throughout its range, is still hunted and shot or poisoned; 2) Modern methods of domestic animal husbandry reduce the number of carcasses available to carrion eaters generally. Far from being pests, this species, like all carrion eaters, are nature's mechanism for dealing with dead animal matter and keeping the food chain going. Thanks, Elena!

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 785-273-9149; FAX (785) 273-1980; email is akfeditor@zk.kscoxmail.com< If you have questions about submission guidelines, please contact the Editor.

Deadline for each regular issue is the 10th of the preceding month.

Dedicated issues may have separate deadline dates and will be noted by the editor.

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. If an article is shown to be separately copyrighted by the author(s), then permission must be sought from the author(s). Reprints of material appearing in this journal may be ordered from the editor. Regular back issues are available for \$4.00 each. Special issues may cost more.

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AAZK website Address: www.aazk.org

BFR Website: <http://aazkbfr.org>

Scoops & Scuttlebutt



Reminder to All AAZK Chapters on Recharter Process for 2009

All AAZK Chapters are reminded that the rechartering of all Chapters will begin in January 2009. Rechartering packet information will be sent electronically via email to the email address each Chapter has provided to the Administrative Office in 2008.

These emails will be sent the first week in January. **NOTE:** If your Chapter has changed its email contact address since you completed your 2008 recharter forms, you need to notify Barbara Manspeaker immediately (aazkoffice@zk.kscoxmail.com) so that your recharter materials are properly received. Recharter Packets for 2009 are due back at Administrative Offices **by 15 February 2009** (with late fees applicable after 1 March 2009).

If you do not receive your recharter materials by early January, you need to contact Barbara at the email address above or by calling 785-273-9149. If you have questions about filling out the required information, give Barbara a call and she will be glad to help you out. Receipt of rechartering information from **every** AAZK Chapter is required as AAZK needs to submit certain information to the Internal Revenue Service in order to protect AAZK's 501(c)(3) nonprofit status. Your prompt attention in this matter is greatly appreciated.

Two Becomes One - Training & Enrichment Committees Merge

submitted by Deana Walz, Chair BHC, Manager of Bird Programs, Tracy Aviary, Salt Lake City, UT

At the 2008 National Conference in Salt Lake City, members from the Enrichment Committee and members from the Animal Training Committee met with the Board of Directors to discuss a proposal. The proposal presented to the Board was to create a new committee that would merge the enrichment and animal training committees together. The Board approved the proposal and thus the Behavioral Husbandry Committee was formed.

The Mission of the AAZK Behavioral Husbandry Committee is to enhance animal welfare through promoting the use of environmental enrichment and training in the care and management of zoological collections.

All committee members are very excited about the formation of the new committee and have already begun planning new and exciting workshops for next year's National Conference in Seattle. We look forward to serving the AAZK membership and becoming a great resource for all members when looking to improve or advance their behavioral husbandry programs.

The Behavioral Husbandry Committee is made up of the following members:

Deana Walz (Tracy Aviary) – Chair

Angela Binney (Disney's Animal Kingdom)
Nichole Bouwens (Zoo Atlanta)
Audra Emberton (Disney's Animal Kingdom)
Julie Hartell (Oakland Zoo)
Kim Kezer (Zoo New England)
Richard Kotarsky (Tulsa Zoo)

Jonathon Miot (Lincoln Park Zoo)
Jay Pratte (Zoo Atlanta)
Vernon Presley (Toronto Zoo)
Beth Rich (Racine Zoo)
Catherine Vine (Philadelphia Zoo)
Christina Stamer (Dallas Zoo)

Robin Shewokis (The Leather Elves) – advisor
Dawn Neptune (Utah's Hogle Zoo) – advisor

Tammy Root (Indianapolis Zoo) – Board Oversight

2009 Board of Directors Election

CALL FOR NOMINATIONS

Board members Denise Wagner, Phoenix Zoo; Tammy Root, Indianapolis Zoo; and Jacque Blessington, Kansas City Zoo will soon be completing their terms on the AAZK Board of Directors. AAZK is now soliciting nominations from the membership of individuals interested in running for the Board in 2009. Nomination/Nominator forms, as well as criteria for nominations, will not be run in *AKF* as we have done in the past, but will be available for download from the AAZK website (www.aazk.org) beginning 1 December 2008. Forms need to be completed and returned to the AAZK Administrative Office (3601 SW 29th St., Suite 133, Topeka, KS 66614-2054) by **28 February 2009**.

The 2009 election itself will be handled electronically from the Member's Only section of the AAZK website (www.aazk.org). **IMPORTANT: You will only be able to vote in the 2009 election if your AAZK membership is current and if you are a registered user on the Member's Only section of the website. So make sure you are registered by April 1st! Only Professional members may vote in a Board of Directors election.**

Candidate profiles will be posted on the website beginning 1 April 2009 and electronic voting will take place between 15 April and 1 June 2009.

National Zoo Keepers Week 2009

It's time to mark your calendars and start making plans to celebrate National Zoo Keepers Week for 2009 that is planned for the week of July 19-25th. All AAZK Chapters and individual AAZK members are encouraged to plan events at your facility that highlight the vital role that zoo keepers play in maintaining healthy exotic animal specimens, serving as front-line educators for the visiting public, and participating in conservation and research projects locally and around the world. It's time to meet with your facility's administrators and zoological societies and talk about how you might cooperate in promoting this week of recognition for all those in the zookeeping profession. Watch for further information and updates in *AKF* and on the website. Plan to share what you have planned with other Chapters and our *AKF* readership by sending in information and photos on how you celebrated this week.

New Chair Announced for Professional Development

Board oversight Bob Cisneros, San Diego Zoo, has announced that Melaina Wallace from Disney's Animal Kingdom has been named Chair of the AAZK Professional Development Committee. The focus of this committee is to provide professional development opportunities to the AAZK membership through workshops at national conferences.

Third Orangutan SSP® Workshop Scheduled for 2009

This workshop will focus on the care and management of the orangutan in zoological parks and sanctuaries. The workshop will bring together orangutan caregivers and managers, researchers, and field biologists to share and disseminate the most current information on husbandry, conservation, and emergent issues pertaining to captive and wild populations of orangutans.

Workshop registration fee (TBD) covers all morning/afternoon breaks, lunches, and dinners over the three days, as well as the workshop t-shirt. An icebreaker will be held on the first night, and a silent auction will be held on the final evening during the closing banquet with all proceeds to benefit the Orangutan Conservancy (OC). The workshop will be held in conjunction with the Orangutan SSP® Masterplan meetings which will take place on Sunday, 30 August 2009 prior to the workshops start on Monday, 31 August 2009.

Some of the exciting things that we are working on for this workshop that will be new in 2009 are a pre-workshop trip to the Georgia Aquarium (the world's largest aquarium) on Sunday, 30 August 2009 (please note an additional fee may apply), group training demonstrations, an enrichment device exchange, demonstrations of Zoo Atlanta's on-exhibit touch-screen cognitive testing system, and many other exciting activities and events.

Registration will begin some time early in 2009 with 100 spots available. Stay tuned for more information as it becomes available. For additional information contact Thomas Heitz at theitz@zooatlanta.org or thomas.heiz@gmail.com. You may also call 404.624.5939 (work), or 404.414.9178 (cell).

Year-end Thoughts from the AKF Editor

As editor for *Animal Keepers' Forum*, I would personally like to thank the following AAZK Chapters for designating their support for the production costs of *AKF* during the 2008 rechartering process: South Florida, Audubon, Phoenix and St. Louis. *AKF* is the primary communication's tool for our Association and gives AAZK the opportunity to disseminate information on animal husbandry, training, enrichment, conservation and a myriad of other topics of interest to the profession. I hope more Chapters will consider designating their Duty Obligation within the recharter process towards the continual upgrading and expansion of the *Forum*.

I would also like to thank a longtime AAZK member, who prefers to remain anonymous, for his donation of \$1000 towards the expenses of producing *Animal Keepers' Forum*.

While I technically put the *AKF* together every month, it would not happen without the contributions of many people. First, I would like to thank those individuals who coordinate the regular columns found in the journal: Rachel Denault (Enrichment Options); William K. Baker, Jr. (Reactions); Angela Binney, Kim Kezer and Jay Pratte (ATC/Training Tales); Penny Jolly and Amanda Kamradt (Conservation Station); and Becky Richendollar and Greg McKinney (Conservation/Legislative Update).

Secondly, I would like to thank all those keepers who have submitted articles for inclusion in *AKF* over the past year. You have broadened the knowledge base of all AAZK members by sharing your experiences (good and bad), your research efforts, your husbandry and enrichment ideas and training techniques, as well as your commitment to both *in situ* and *ex situ* conservation. I hope you will all continue to contribute to your professional journal during 2009. We plan to produce a couple of special issues during 2009 and hope you will consider contributing information for these dedicated topic editions of *AKF*. (See Call for Papers that follows)

I have special thanks to those AAZK members who have shared their passion for wildlife and zookeeping through their drawings that have graced the covers of the *Forum* during 2008. The inclusion of original keeper-generated artwork on the cover of *AKF* has been one of the things that has kept it unique among zoological publications worldwide. In the coming year we will also plan to use more color photographs and thank all those who have submitted photographs to our photo library.

Finally, thanks to my Associate Editors Kayla Grams and Mark de Denus for their support, counsel and contributions over the years of their service to AAZK and *AKF*. And I could not close without thanking my co-worker and friend Barbara Manspeaker for her efforts in proofreading for *AKF*, and the AAZK Board for trusting my judgement in the production of *Animal Keepers' Forum*.

As I close out my 28th year as *AKF* Editor, I look forward to the exciting challenges ahead for both the journal and for AAZK. I hope to hear from many of you in 2009--make this your year to contribute!



Susan D. Chan, Managing Editor
Animal Keepers' Forum

Call for Papers for Dedicated Issue of AKF

Many zoological institutions in the U.S. and elsewhere are finding specimens within their collections are aging. In April of 2009 we are hoping to produce a dedicated issue of *Animal Keepers' Forum* dedicated to the challenges of dealing with geriatric exotic animals in captive zoo settings. We are seeking articles on what challenges have been faced (diet, housing, vet care, enrichment, etc.) and how they have been met. We would like to see papers discussing how your facility has dealt with the care and management of an animal in the last years of its life. We know there have got to be lots of good examples out there and we would hope that you might choose to share them through the pages of this dedicated issue.

Papers should be submitted electronically in MS Word only to akfeditor@zk.kscoxmail.com. Please put Geriatric Special Issue in your subject line. Papers should be no more than 10 pages in length. Any charts and/or graphs should be submitted as separate jpg or tif files along with the manuscript. We would encourage photos of your animals to include and these should also be submitted electronically as either jpg or tif files.

If you cannot submit your materials electronically, you may send them on a disk or CD to: Dedicated Issue, AAZK, Inc. 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. If you cannot submit photos electronically, you may also send 3 x 5 inch prints. Be sure to indicate proper photo credit.

You should also include your complete contact information including address, email and a daytime phone number where you may be reached if we have questions concerning your submission.

Deadline for receipt of articles for consideration is 10 February 2009.

Dear AAZK Members,

The Greater Houston Chapter of AAZK would like to announce that we are organizing a Hurricane Relief Fund for the staff at Moody Gardens, Downtown Aquarium, and the Houston Zoo. Most of you have probably seen the devastation of Galveston Island from Hurricane Ike on the national news. Many of the keepers and staff were affected and are in need of financial help. You can help play a part by having your Chapter donate to our Hurricane Ike Relief Fund. Please contact GHCAAZK Chapter President Pam Jones at the Houston Zoo (pjones@houstonzoo.org). Thank you for your support.

Rachel Hymas, GHCAAZK Liaison

Coming Events

Post Your Coming Events Here
email to: akfeditor@zk.kscxmail.com

International Symposium on Bat Migration - January 16-18, 2009 in Berlin, Germany. For further info: batmigration09@izw-berlin.de or check the web page at <http://www.izwberlin.de>

5th International Workshop on Ultrasound & Assisted Reproduction in Elephants, Rhinoceros and Giraffe - January 22-25, 2009 in Cambridge, Ont., Canada. Program will include lectures and practical sessions. Hosted by African Lion Safari. Registrations due by Dec. 15, 2008. For information contact charlie Gray, African Lion Safari, RR# 1, Cambridge, Ont. N1R5S2, Canada or email cgray@lionsafari.com

Zoos and Aquariums Committing to Conservation - January 23-26, 2009. Hosted by the Houston Zoo, Houston, TX. ZACC is a bi-annual event that promotes the role of zoos and aquariums in supporting conservation activities worldwide, both at their institutions and in the field. The '09 conference will have participants from over 20 countries and 60 presentations are currently included in the Program Draft now available as a pdf download from their website. For info contact: <http://www.houstonzoo.org/zacc> For questions you may call 713-533-6745/6836 or email conservation@houstonzoo.org

International Association of Avian Trainers and Educators 17th Annual Conference - February 24-28, 2009 hosted by the Cincinnati Zoo & Botanical Gardens. "09 in Nati" will feature papers, posters, site visits, roundtables, vendors and workshops. Topics include avian behavior, training, husbandry, conservation, strides in veterinary care, as well as show presentation, production and educational content. For further info please visit www.iaate.org or contact Eddie Annal at ed.annal@cincinnati.zoo.org

International Cassowary Summit - April 1-4, 2009 in Cairns, Queensland, Australia. The Australian Rainforest Foundation (ARF) invites you to the inaugural International Cassowary Summit held in the heart of the World Heritage listed West Tropics in tropical northern Queensland. The conference is focused on bringing together scientists, researchers, zoo curators, natural resource management and environmental groups to formalize how we must act and in what timeframe to ensure the survival of this keystone rainforest species. Workshops, plenary sessions and field trips will address a Recovery Plan for the cassowary, the current state of research, captive breeding, habitat analysis and threats, and potential wild releases. For more info email: info@arf.net.au

2009 Animal Behavior Management Alliance (ABMA) Conference - April 26 - May 1, 2009 in Providence-Warwick, RI at the Crowne Plaza Hotel. The theme is "Bridging the Gap" - bringing together trainers, handlers, and keepers of animals, irrespective of species to share information and address topics to help develop a comprehensive behavior management program. Does your behavior management program need a little spicing up? Join us to learn new techniques on how to connect with the animals in your care; including interactive

training and enrichment workshops; and the importance of evaluating and documenting your behavior management program. All conference details, including the 1st Call for Papers, are available at www.theabma.org Send inquiries to Penny Krebs at pennkrebs@cox.net or to Jen Hennessy at jhennessy@rwpzoo.org

Prosimian Husbandry Workshop - April 30- May 2, 2009. Hosted by the Cleveland Metroparks Zoo. The workshop will emphasize group discussion of captive prosimian husbandry and management issues. Look for registration, lodging, and workshop information at the workshop web-page, www.clemet zoo.com/prosimianworkshop

2009 Rhino Keeper Workshop - May 17-21, 2009 at Busch Gardens, Tampa, FL. Please watch website www.rhinokeepersassociation.org for updates regarding the workshop. Any inquiries may be directed to: internationalrhinokeepersassociation@gmail.com

International Conference on Diseases of Zoo and Wild Animals 2009 - May 20-24, 2009 at Safaripark Beekse Bergen, Hilvarenbeek, The Netherlands. For information contact: 2009@zoovet-conference.org or see <http://www.zovet-conference.org>

The 9th International Conference on Environmental Enrichment - May 31 - June 5, 2009 in Torquay, Devon, UK. First Call for papers and Registration. Go to www.reec.info for details. First Call for Papers and registration-go to www.reec.info for details.

Joint 36th National AAZK and 3rd International Congress on Zookeeping Conference - September 24-29, 2009 in Seattle, WA. Hosted by the Woodland Park Zoo and the Puget Sound Chapter of AAZK. Check out www.pugetsoundaazk.org/ for conference information. **2nd Call for Papers:** You are invited to submit abstracts of papers, posters & workshops on any aspect of zoo work. More information and guidelines can be found at the ICZ website www.iczoo.org Abstracts for oral and poster presentations should be written in English, no more than 600 words long, and in RTF or MS Word® format. If you want to run a workshop focused on developing zoo keeper skills, please send a short description. Please mark 'ICZ Abstract' and send to: Paul Howse, ICZ Steering Committee at p.howse@chesterzoo.org **Deadline for abstracts is 1 April 2009.**

Neotropical Primate Husbandry, Research, and Conservation Conference - October 13-15, 2009 in Chicago, IL. Hosted by the Brookfield Zoo. This conference will focus on a variety of topics pertaining to neotropical primates and will bring together staff from zoological parks, sanctuaries, and universities, as well as field researchers and range country biologists to share the most current information on husbandry, conservation, and emergent issues pertaining to captive and wild populations of neotropical primates. The workshop will include three days of presentations, a poster session, as an icebreaker, silent auction, and banquet. Additional information will be made available in late 2008. Please contact vince.sodaro@czs.org for additional information.

AAZK Announces New Members

New Professional Members

Melisa Holmstedt, **Turtle Back Zoo (NJ)**; Philip Spinelli, **Seneca Park Zoo (NY)**; Katelyn Dever and Robbie Frazier, **Birmingham Zoo (AL)**; Lynzi Leffler, **Louisville Zoo (KY)**; Nancy Brown, **Brown's Oakridge Zoo (IL)**; Sara King, **Austin Zoo (TX)**; Amanda Newman, **Sea World (CA)**; Alan Foster, **Oakland Zoo (CA)**; Dayne Sherwood, **San Francisco Zoo (CA)**; Greg Lalonde, **Toronto Zoo (Ontario, Canada)**. Beginning with the March 2008 issue of *AKF*, we no longer print the names of those Professional Members who do not list their facility on their membership application/renewal.

Renewing Institutional Members

Erie Zoo, Erie, PA
Cynthia Kreider, President/CEO

Dickerson Park Zoo, Springfield, MO
Mike Crocker, Director

Turpentine Creek Wildlife Refuge
Eureka Springs, AR

Houston Zoo, Inc., Houston, TX
Rick Barongi, Director

New Institutional Members

Silly Safari Shows, Inc.
Indianapolis, IN

Northeastern Wisconsin Zoo
Green Bay, WI
Neil Anderson, Director

Lake Superior Zoo, Duluth, MN
Leslie Larsen

The Exotic Cat Refuge and Wildlife Orphanage, Inc.
Kirbyville, TX
Monique Woodard, Director

Pikes Peak Community College,
Colorado Springs, CO
Tracey Anderson, Zookeeping Liaison

Another Website to Check Out

The Ring-tailed Lemur SSP® is pleased to announce the establishment of our online fundraising store. Proceeds will go directly to assist in supporting conservation and



education projects that will benefit the Ring-tailed lemur population. The site features a wide selection of items including holiday designs featuring

original artwork by retired AAZK member Val Beardsley.

Be sure to visit *The Catta Closet* at www.cafepress.com/rtlssp. This site will soon be linked to our official SSP® website currently under construction.

---submitted by Linda King, Dallas Zoo,
on behalf of the RT Lemur SSP®

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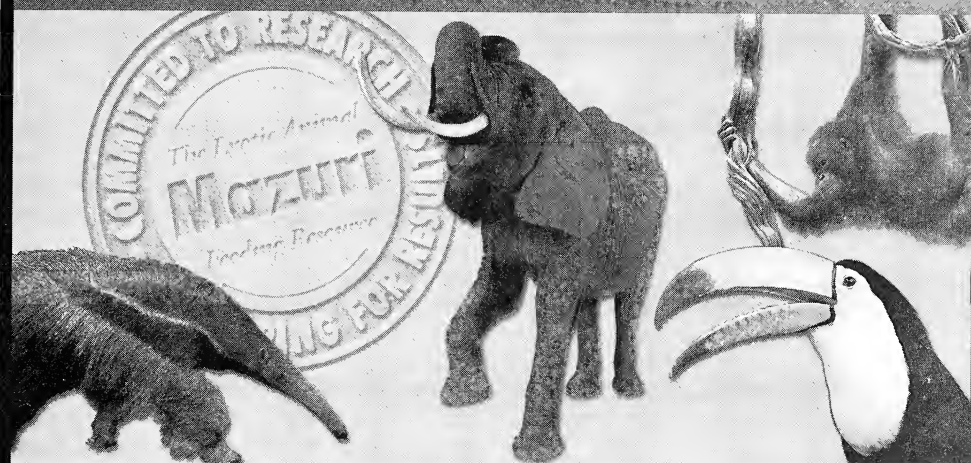
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ICZ AAZK CONFERENCE

2009 SEATTLE USA

September 24 - 29, 2009

“One World, One Zoo”

The Puget Sound AAZK Chapter is proud to host the 3rd International Congress on Zoo Keeping and the 36th Annual American Association of Zoo Keepers National Conference in Seattle. This is the first joint conference of ICZ and AAZK and the first time ICZ has ever been hosted in the United States. Conference dates are September 24th - 29th 2009. This is a six-day conference not including pre/post trips.

Seattle is anything but ordinary. It's a city where the extraordinary is commonplace and commonplace is anything but. And if you look closely, you just might discover that in Seattle there are amazing things happening all around you. From a jet engine to an espresso machine to grunge rock, Seattle's world-changing events have all had a distinct sound. But the symphony doesn't end there. Your visit to Seattle may bring you the sound of an orca blowing as it surfaces, the roar of the crowd at Safeco Field or the near silence of the Olympic rainforest. Come to Seattle and hear for yourself.

Conveniently located in downtown Seattle is our host hotel, The Red Lion Hotel located on 5th Ave. The Red Lion Hotel offers an upscale, boutique hotel experience, personal, award-winning service, first-class meeting space, and - perhaps most importantly - breathtaking views of the Cascade Mountains, Elliot Bay, the Puget Sound and the Emerald City itself.

Washington State's great scenic and environmental diversity make it a utopia for outdoor enthusiasts. Whatever you like to do outdoors, you can do it here. The pre and post conference trips will explore the unique and natural beauty that Washington has to offer. The Pre-Conference Trip takes you to the NORTH CASCADE MOUNTAINS September 21 - September 23rd. Travel from beautiful Puget Sound over to the Cascade Mountains and into the Columbia River Valley. All things Washington, you will see stunning scenery, charming communities, and National Parks. Savor each step of this incredible journey exploring the entire loop. The Post-Conference Trip takes you to the OLYMPIC NATIONAL PARK September 30 - October 2nd. Just forty miles from where forest and surf collide, icy mountain peaks pierce the sky. In between these extremes, ancient trees draped in moss reside deep inside a temperate rain forest. Salmon and steelhead make annual runs up rivers that flow all four directions from these jagged peaks, but the heart of Olympic is wilderness; a primeval sanctuary for humans and wild creatures alike.

Check the PSAAZK Chapter website at www.pugetsoundaazk.org for more information and updates! Are you up to the challenge? AAZK Chapters will be receiving information in the mail soon about the 2009 Chapter Challenge and other sponsorship opportunities.

--Peter McLane -- PSAAZK Chapter Liaison

Maturation of an All-Male Group of Red-capped Mangabeys at Brookfield Zoo – Part 2

By Sheila Wojciechowski
Senior Keeper, Primate Department
Brookfield Zoo, Brookfield, IL
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Introduction

In 1997, the Mangabey SSP® identified five surplus male red-capped mangabeys (*Cercocebus torquatus*). These individuals from two different zoos came to Brookfield Zoo where these sub-adults were successfully introduced to each other to form an all-male group (see Part 1, Animal Keepers' Forum, Nov. 2008, pgs. 449-454). While it has been suggested that all-male groups are more likely to be compatible if they are formed prior to sexual maturity (Lindberg et al, 1997; Watts and Meder, 1996), that certainly is no guarantee. These groups must be closely monitored and often-tough decisions need to be made. Below is a chronology of what happened to Brookfield Zoo's bachelor group of red-capped mangabeys throughout maturity. See previous paper for the formation of the group and interactions for the first 225 days.

Methods

Subjects

The focal animals of this study consisted of a group of five male red-capped mangabeys as listed in the table below:

Name	Age (at introduction on 17 January 1998)	Weight (kg) Prior to intro	Subgroup
M'Kenje	4 yrs, 2 mo	6.8	Duo – full siblings from Denver Zoo
Rocket	3 yrs, 7 mo	5.6	
Jester	2 yrs, 9 mo	4.5	Trio – half siblings from Houston Zoo
Linus	3 yrs, 4 mo	5.6	
Stormy	3 yrs, 5 mo	5.2	

Table 1: Subjects of current study

Study Site

All observations took place in Brookfield Zoo's Tropic World Africa exhibit. This is a large (40m long, 20m wide, 20m tall), naturalistic mixed-species exhibit, also housing 3.4 mandrills (*Mandrillus spinx*), 1.5 sooty mangabeys (*Cercocebus atys*), 3.3 colobus (*Colobus guereza*), and 0.1 pygmy hippopotamus (*Hexaprotodon liberiensis*). We believed the large exhibit space with plenty of areas to avoid physical and visual contact with other animals was conducive to an experimental all-male group. Overnight, the animals were housed in three interconnecting enclosures, each measuring 4.8m long, 2.8m wide, and 2.8m tall. Even though this area was smaller, an effort was made to maximize the vertical space and ensure there were no places where an animal could be cornered or trapped. Each of the cages contains a structure made from plastic wood. This structure provides a surface (measuring 2-4m long and 2-3m wide) that is hung about 1m below the ceiling. There are also Corian® shelves on the sides and back of each cage.

Procedures

Two different sampling methods were used to collect data. The initiator and recipient of all affiliative, aggressive, and submissive behaviors were recorded using an all-occurrences sampling method for 25 minutes. At the same time, instantaneous focal animal sampling at one minute intervals was done to record state behaviors such as grooming, playing, and neighbors (within two meters) of each of the red-capped mangabeys. Each of the red-capped mangabeys was the focal animal for five minutes. Data collection occurred during the following three time intervals 9:30-10:30, 12:00-1:00, and 3:00-4:00. Intensive observations were made during the first seven months the animals were together (see Part 1, Nov. 2008 *AKF*). Thereafter, as reported in this paper, three observations



were collected per month from September 1998 through January 2003, resulting in 53 hours of observations.

Results and Discussion

The first break-down of our group did not happen due to any social problems. Rather, one of the bachelors was needed by the SSP® for breeding. Any of our five males was a good genetic match. Therefore, it was completely up to us which one we sent. The data collection proved to be valuable at this point as it was used to predict which individual might be most likely to inhibit the long-term success of this group. While Stormy was the lowest in dominance rank, he was the most frequent initiator of aggression towards the two most dominant individuals, which would always result in him receiving more aggression back. Because he was constantly trying to oppose (or unsuccessfully takeover?) the dominance rank, we believed he was potentially the most detrimental individual to the long-term success of the group. Stormy was sent to Philadelphia Zoo on 12 July 1999.

Rocket, red-capped mangabey

First 3 1/2 Years

Overall, throughout the first 3 1/2 years of the study, the level of aggression decreased (Figure 1). While this may seem like a positive thing, the smaller amount of aggression was more serious aggression. As Figure 2 illustrates, the number of actual wounds that occurred increased.

Throughout this time, several husbandry decisions were made in an attempt to lesson the aggression. The first wound (a 1-inch superficial laceration on M'Kenje's head) was observed by keepers on 18 May 1999. Wounds were few and far between at first, with nine wounds occurring over the next 18 months, and only two required the vets to suture them. However, we realized 50% of the wounds were occurring overnight while the group was eating in their smaller off-exhibit holding area. Also during this time, keepers observed Rocket being more peripheral to the group and choosing not to shift off-exhibit with the group. On 16 November 2000, we made the decision to house Rocket (age 6 yrs, 5 mo) in a separate enclosure overnight, while the remaining three individuals stayed together in the other two enclosures overnight.

Beginning in April 2001, we began to see an increase in aggression between M'Kenje and Linus. Five wounds occurred during the next two months, with three of the lacerations requiring sutures. Even though most of the wounds occurred on exhibit during the day, we still felt reducing the tension at feeding time in their holding area could help reduce overall aggression. Therefore, we began separating M'Kenje and Linus overnight. The remaining individual, Jester, was given the choice as to which animal he stayed with overnight. Interestingly, he chose M'Kenje. Jester and M'Kenje were unrelated individuals that were introduced to each other at the start of this study. The first paper demonstrated that Jester formed a coalition with Rocket and M'Kenje. This bond seemed to stay as they matured, as Jester was now more compatible with M'Kenje than his own sibling, Linus.

Figure 1: Agressive bouts per hour

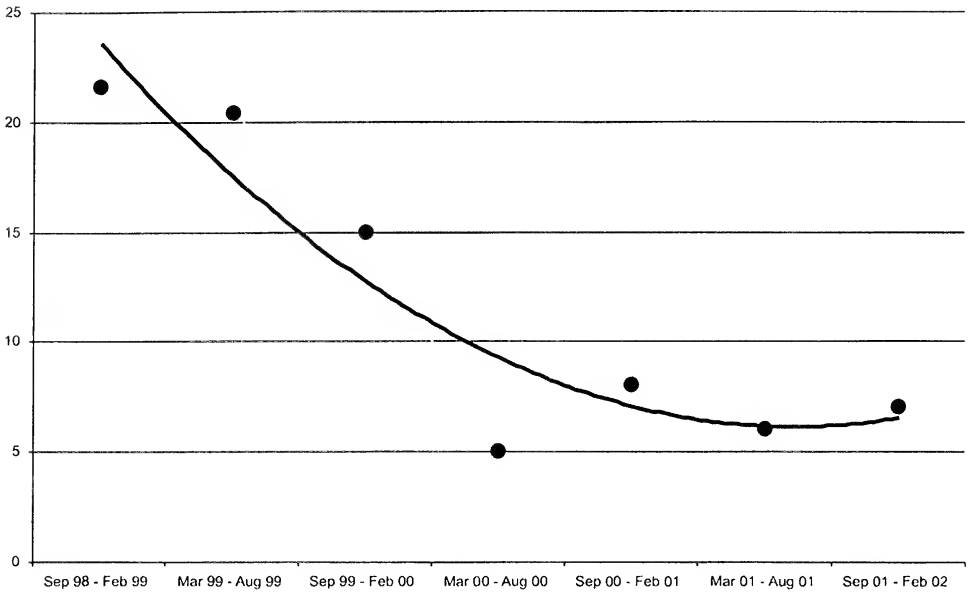
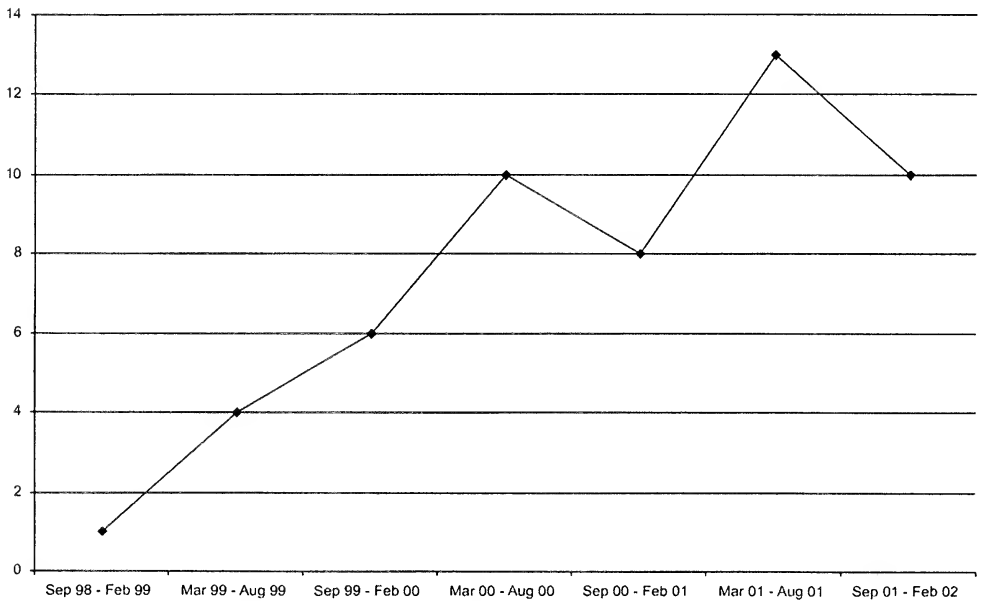


Figure 2: Number of wounds that occurred during the six-month period



Unfortunately, Jester and M'Kenje's relationship did not stay strong. On 19 October 2001, Jester chose to stay with Linus overnight instead of M'Kenje. For the next year keepers allowed Jester to choose daily which cage he wanted to come in and with whom he wanted to be housed. This strategy of allowing the animal to choose his social housing situation worked well. However, by November 2002, Jester needed to be housed alone overnight due to aggression he was receiving during the a.m. feeding.



**M'Kenje, red-capped mangabey,
being groomed by 0.1 sooty mangabey.**

Years 4-5

A potentially detrimental event to our all-male group happened from March through May of 2002. During this time, the exhibit was shut down for repairs. As the animals needed to be housed separately in the off-exhibit enclosure, the animals were separated this entire three-month period. The animals remained in visual contact of each other this entire time. We successfully reunited the animals on exhibit after completion of exhibit work. They remained exhibited together for another eight months. However, we saw a large increase in the number of wounds that occurred and the number of injuries that required veterinary attention (Table 2).

	# of wounds	# of wounds that required veterinary attention
Average each six-month period beginning Sep 98 through Feb 02	7.4	1.7
Six-month period following three-month separation Jun – Nov 2002	10	3

Table 2: Change in number of wounds and wounds needing treatment

The ability for us to keep this bachelor group together would greatly benefit the Mangabey SSP®. With mangabeys being housed in uni-male groups in captivity, these males are surplus to the population. With limited space in zoos, placing these animals somewhere else was very difficult. As we saw in the initial study, aggression can be most frequent while animals are developing a relationship. While these animals have been together a long time, they are in early adulthood/sexual maturity now. We hoped that if we allowed some aggression to occur, they would develop a dominance structure to allow them to peacefully co-exist long-term. This would be the best situation for the individual animals involved as well as the captive mangabey population. Making the decision as to how much aggression to allow the animals to develop their dominance structure is difficult to

make. However the next two months resulted in a three-fold increase in the number of wounds that occurred and the number that required veterinary attention (Table 3)

	# of wounds	# of wounds that required veterinary attention
Average each six-month period beginning Sep 98 through Feb 02	7.4	1.7
Six-month period following three-month separation Jun – Nov 2002	10	3
Pro-rated final two months Dec 02 – Jan 03	30	9

Table 3: Shows three-fold increase in incidence of wounds

On 25 January 2003, the decision was made in the best interest of the animals to discontinue this experimental red-capped mangabey all-male group. Even though they were introduced to each other as juveniles and formed a cohesive group with minimal aggression and many positive affiliative interactions – including playing, resting together, and bonding together during threats from additional species (see Part 1, Nov. 2008 *AKF*), it did not support the long-term success of the entire group staying together. However, the group was not completely dissolved. To this day, we are able to manage the four individuals in pairs. All individual remain separated in their holding areas. But we are able to exhibit two animals together. Even though the lines between the two subgroups were blurred during the study with Jester seeming to be more bonded with the duo, in the end the original subgroups held true. We are now able to manage the animals separately while in holding, but in sibling pairs on the exhibit. Rocket/M’Kenje (who are full siblings) and Linus/Jester (half-siblings) are rotated on exhibit every other day without any aggression problems.

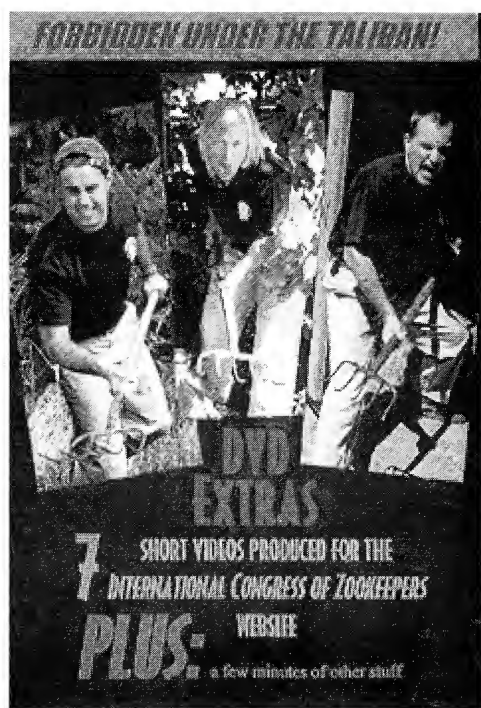
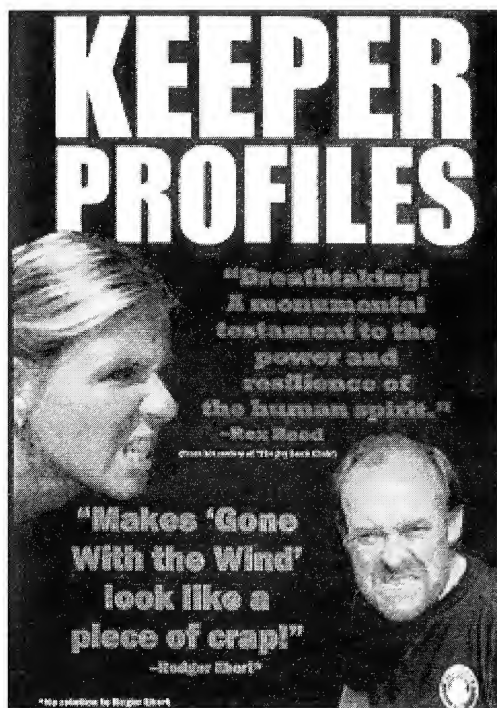
Conclusion

Case studies of all-male groups and the factors that increase their success are important for many Old World monkey SSPs® due to the surplus male problem. Limited information suggests that forming bachelor groups while animals are immature increases the likelihood of their success. Also, having a large exhibit should also increase the success. Despite having these two factors on our side, this all-male group was not successful. However, through careful monitoring and data collection, appropriate decisions were made as to the best management of this group and in the end, a workable situation is done in the best interest of the individuals at Brookfield Zoo and the mangabey population.

Rocket, red-capped mangabey

(Photos courtesy of Chicago Zoological Society)





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REACTIONS

A Question and Answer Forum for the Zoo Professional on Crisis Management

By William K. Baker, Jr., Director
Abilene Zoo, Abilene, TX



Question

There are literally hundreds of items on the market for modifying firearms, how can I tell a gadget from something that can be really helpful?

Comments

You are quite right, there are literally hundreds, if not thousands of gadgets on the market today; and, not unlike those annoying infomercials that raise the volume of your television they all promise to make life better. Personally, I believe that there are a few items on the after-market that can be helpful. But by and far, the vast majority are crutches for poor marksmanship or sub-standard weapons.

Rifles

First and foremost, purchase a quality rifle in a reliable caliber. If you spend the money on the front end of the process you won't be disappointed. The current trend is a shift towards purchasing heavier caliber firearms, specifically rifles. Many institutions still favor the 30-06 Springfield for its reliability, familiarity, and the broad selection of ammunition, and with the right ammo it can be effective in use against the vast number of animals in a collection during a crisis.

Still, the .375 H&H is by far the most popular all-around choice, which really shouldn't come as a surprise, since historically it is the preferred choice of Professional Hunters in Africa. Two calibers of note these days are the .338 Winchester and the .45-70, both of which are really solid performers and offer significantly larger bullets than most calibers. Bolt-actions are still the first choice, but the .45-70 in a lever action is remarkably fast in the right hands and easy for smaller shooters to use.

Sights

Quality sights are a must on your firearm. Historically rifles came from the factory with open sights; however I am seeing more manufacturers's forgoing this item and just drilling and tapping for rifle scopes. Considering the ranges at which crisis incidents occur, I strongly recommend adding iron sights if they are not included. For rifle scopes, any of the major manufacturers are solid choices such as: Leupold, Zeiss, Kahles, Trijicon, Nikon, and Swarovski. Once again, price equals quality. I also recommend purchasing claw-mount or detachable scope rings so that you can use your iron sights when needed. For iron sights I recommend the Williams brand.

Bipods

Another useful item for your rifle is the addition of a bipod to provide a more stable shooting platform. While you will likely take a shot in an emergency from an off-hand position, there will be times when a bipod attached to the forearm will prove useful. Of the companies on the market, I highly recommend the Harris Bipod line. They are often the bipod of choice for the military, law enforcement, and hunters.

Available through: Cabela's
400 E Avenue A
Oshkosh, Nebraska 69190

800-237-4444
www.cabelas.com

Shotguns

Still, the vast majority of the time, what comes off the shelf at the local gun shop is really oriented more towards hunting than tactical usage. There are, of course, exceptions to the rule and this situation is no different. Shotguns that are oriented for use by law enforcement or military personnel are available, but as a general rule they tend to go for considerably more money.

So, in reality there are two options: One, buy a firearm that already has all the bells, whistles, and design features from off the shelf. Two, modify an existing firearm as an upgrade or build up an off-the-shelf model to save money.

TacStar

This company manufactures numerous products specifically for modifying shotguns including Mossberg, Remington and Winchester. Their product line includes: Slings, ventilated barrel shrouds, tactical grips, SideSaddle® ammunition carrier, barrel magazine clamps, magazine extensions, tactical lights, and shotgun cases.

Available through: Cabela's	800-237-4444
400 E Avenue A	
Oshkosh, Nebraska 69190	www.cabelas.com

Speedfeed

This company specializes in aftermarket products and their line includes: Synthetic stocks and forearms, of which certain designs have integrated ammunition storage in the stock.

Available through: Brownells, Inc.	515-623-5401
200 South Front Street	
Montezuma, Iowa 50171	www.brownells.com

Choate and Scattergun Technologies

These companies specialize in aftermarket products for modifying existing firearms. Their line includes: Synthetic stocks and forearms, magazine extensions, pistol grips, and numerous other products.

Available through: Brownell's, Inc.	515-623-5401
200 South Front Street	
Montezuma, Iowa 50171	www.brownells.com

Next Column (January 2009): Are there any precautions I should consider prior to international travel?

If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614 Attn: Reactions/AKF.

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor. Away from work he operates Panthera Research, and may be contacted at puma_cat@hotmail.com.)

Zoos Mourn Deaths of Elephant Calves

Two North American zoos have recently lost Asian elephant (*Elephas maximus*) calves to elephant herpesvirus. Elephant endotheliotropic herpesvirus (EEHV) is a recent discovery identified in 1995 by researchers at Smithsonian's National Zoo and Johns Hopkins School of Medicine. Many animals and humans carry herpesviruses throughout their lives and never become sick. For reasons not fully understood, herpesviruses can come out of latency and circulate throughout the bloodstream. Most elephants are able to fight the virus and survive and calves appear to be the most susceptible after they have been weaned.

Such was the case with Malti, a year old calf from the Calgary Zoo in Canada and Mac, a two-year-old from the Houston Zoo in Texas. Staff and zoo visitors alike are struggling with the loss of these two young animals who, needless to say, had been favorite attractions at both facilities.

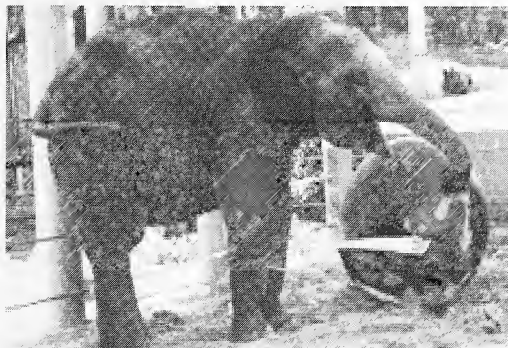


Malti - Calgary Zoo

(photo courtesy Calgary Zoo)

Malti began to show symptoms of EEHV in late October and succumbed to the disease on 1 November, a day after blood tests had confirmed her condition. Zoo officials reported that Malti had awakened from an afternoon nap that day, struggled to get up and then collapsed and died within a couple of minutes. Laurie Herron, the zoo's communications director, said that three of Malti's six keepers were with her at the time and had been profoundly saddened by the death. "They were very attached to her. She was like a child to them and part of their family--part of our family at the zoo," Herron added. Malti was born at the Calgary Zoo in August of 2007.

Because this disease is species-specific, it is likely that Malti contracted it from one of the four adult elephants, said zoo officials. "We can only hope we will learn something from Malti's case that will benefit the research into this disease to help save other elephants in the future," said Cathy Gaviller, director of conservation, research and education at the Calgary Zoo.



Mac - Houston Zoo

(photo courtesy Houston Zoo)

EEHV on 9 November following a brief struggle with the disease. Houston Zoo keepers alerted the veterinary staff that morning when they noticed Mac exhibiting initial symptoms of elephant herpesvirus. The vet staff immediately began administering Fanciclovir, an antiviral that has shown some limited success in past elephant herpes cases. Mac showed an initial upswing in his condition when his appetite rebounded and he took some water. But by 1930hrs Mac died with his mother Shanti and his Aunt Methai at his side. Staff gave the two adult females time alone with the body following Mac's death. Mac was born 1 October, 2006 at the Houston Zoo and set a birth weight record for Asian elephants at 384 lbs.

In Houston, an elephant calf named Mac and known for his mischievous nature, succumbed to

"The entire staff is devastated," said zoo spokesman Brian Hill. "It's difficult to put into words and describe the attachment that has developed over the past two years."

The Houston Zoo, the Association of Zoos & Aquariums, the International Elephant Foundation and other zoos and institutions are supporting the efforts of the national Elephant Herpesvirus Laboratory at Smithsonian's National Zoological Park on testing and treatment of the disease that will contribute to the long-term survival of elephant species both in zoos and in the wild. (Sources: Press Releases from Calgary and Houston Zoos)



A makeshift memorial takes shape in front of the elephant exhibit at the Calgary Zoo following the death of elephant calf Malti last month. The impact the death of such a popular animal has on the visiting public cannot be underestimated and allowing them and zoo staff the opportunity to mourn the loss is important.

Elephant Herpesvirus Q&A

Q: What is elephant herpesvirus?

A: It's a newly discovered virus that is killing zoo elephants. There appear to be two forms of the virus: one that kills Asian (or Indian) elephants and one that kills African elephants. The virus is distantly related to those that causes genital and oral herpes in people.

Q: Who discovered it?

A: Laura Richman, D.V.M., of The Johns Hopkins School of Medicine, Richard Montali, D.V.M., of the National Zoo in Washington, D.C., Gary Hayward, Ph.D., also from Hopkins, and Richard Garber, Ph.D., Pathogenesis Corp. in Seattle, did most of the work isolating and describing the virus and its effects.

Q: How many elephants have died from the virus?

A: There have been 21 known cases of the virus in Asian elephants in the U.S. and Canada; only three have survived. (*Editor's note: does not include Malti or Mac deaths*) Most of the elephant deaths have been in the Asian species; two were in African elephants. Most of the infected elephants were young, usually under two years old. Captive elephants outside North America, including a Swiss circus elephant, also may have died from the virus. The virus has been found in wild African elephants.

Q: How does the virus spread among elephants?

A: It appears that the virus jumps species. That is, African elephants seem to be carriers of the virus that kills Asian elephants, and vice versa. In the wild, the virus is latent in its respective species, causing no more harm than a benign wart. It's only when the virus crosses species — from African into Asian elephants or vice versa — that it becomes deadly. Because African and Asian elephants never have contact in the wild, the deadly effects of the virus were not seen until the two species began to mingle, like in zoos.

Q: How do the researchers know this?

A: Working with African scientists, they obtained skin and blood samples from wild elephants in South Africa and Zimbabwe. In these samples they found virus which had almost identical DNA to the herpesvirus found in the dead Asian elephants. This is strong evidence that the virus jumps from African to Asian elephants. The evidence that the virus jumps the other direction, from Asian to African elephants, is not as strong.

Q: How did the researchers discover the virus?

A: In 1995, the first elephant ever born at the National Zoo in Washington, D.C., Kumari, died mysteriously a few days after becoming ill. When Drs. Richman and Montali autopsied Kumari, who was just 16 months old, they found signs of virus. Later, DNA analysis showed that the virus was a previously unknown type of herpesvirus.

Q: How does elephant herpesvirus kill elephants?

A: Viruses usually target one type of cell — for instance, the virus that causes human herpes infects skin cells. In the wild, the elephant herpesvirus also targets skin cells, but does not do any harm. However, when the virus crosses species, for some reason it attacks endothelial cells, which line the inside of blood vessels. No other known herpesvirus does this. Drs. Richman and Montali, who autopsied Kumari, found tiny sacks holding millions of copies of the herpesvirus inside capillaries in the heart and liver. This is where the virus does its damage — it causes the capillaries to leak blood into the organs. Eventually the virus overruns so many capillaries that the internal bleeding overwhelms the heart, killing the elephant. The virus works quickly, killing in less than a week.

Q: Is the virus always fatal to elephants?

A: No. Two infected elephants, one at the Dickerson Park Zoo in Missouri, the second at the Ringling Brothers Conservation Facility in Florida, lived after veterinarians suspected a viral infection and treated them with a drug called Famciclovir, which is used to treat human herpes. These two successes lend hope that elephant herpesvirus is curable when caught early.

Q: Can elephant herpesvirus infect people?

A: There is no evidence that the virus is dangerous to people.

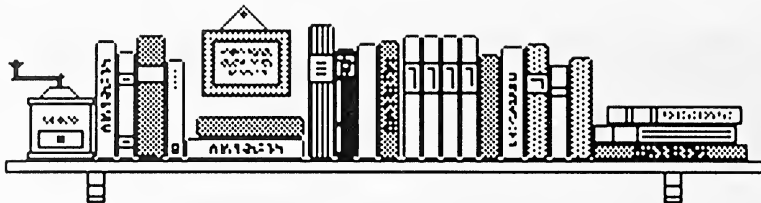
Q: What are some other herpesviruses?

A: Scientists categorize the dozen or so identified herpesviruses into three groups: alpha, beta and gamma. The virus that causes chickenpox, varicella zoster virus, and those that cause human cold sores and genital lesions, called herpes simplex viruses, are in the alpha category. The elephant viruses appear to be most closely related to the beta group.

Q: Why is it important to understand the virus?

A: Asian elephants are endangered, and both Asian and African elephants are difficult to breed in captivity. In the past 15 years, only 34 Asian elephants and seven African elephants have been born in North America. As wild elephant populations decline, it is increasingly important that zoos make every effort to ensure the elephant's survival. This research could reduce the number of premature elephant calf deaths, bettering the chances of the survival of the species.

Source: www.hopkinsmedicine.org



Book Reviews

Threatened Amphibians of the World

2008. Edited by Simon N. Stuart, Michael Hoffmann, Janice S. Chanson, Neil A. Cox, Richard J. Berridge, Pavithra Ramani and Bruce E. Young
Publisher: Lynx Edicions, Barcelona, Spain
ISBN 13: 978-84-96553-41-5
xv + 776 pages \$124.00

Amphibians are facing an extinction crisis, but getting to the facts has been difficult. *Threatened Amphibians of the World* is a visual journey through the first-ever comprehensive assessment of the conservation status of the world's 6,000 known species of frogs, toads, salamanders, and caecilians. All of the approximately 1,900 species known to be threatened with extinction are covered, including a description of threats to each species and an evaluation of conservation measures in place or needed. Each entry includes a photograph or illustration of the species where available, a distribution map, and detailed information on range, population and habitat and ecology. Introductory chapters present a detailed analysis of the results, complemented by a series of short essays written by many of the world's leading herpetologists. Appendices include annotated lists of lower risk species and a country-by-country listing of threatened amphibians.

Available in Canada and the United States from: Lynx Edicions, c/o Postal Express and Fulfillment Center, Inc., 265 Sunrise Highway, Suite 1 #252, Rockville Center, NY 11570; lynx@hbw.com
<http://www.hbw.com/lynx/en/lynx-edicions/>

Review info from: *The Center for North American Herpetology, Lawrence, Kansas*
<http://www.cnah.org>

Raptors in Captivity: Guidelines for Care & Management

By Lori R. Arent of the Minnesota Raptor Center, St. Paul, MN (<http://www.raptorcenter.org>)
Hancock House Publishing 2007 (http://www.hancockhouse.com/products/RAP_index.htm)
ISBN-978-0888396136
Hardcover, 301 pgs. \$49.95

The U.S. Fish and Wildlife Service has endorsed this book as the bible for keeping and maintaining raptors in captivity. If you are a rehabber, zoo curator or falconer here are suggested tips on housing, care, treatment and even record keeping procedures needed to be effectively on top of raptor management.

Also available from Hancock House (2007) and some online distributors is *Raptor Management and Research Techniques* by David M. Bird, Keith L. Bildstein, David R. Barber, and Andrea Zimmerman. Produced by the Raptor Research Foundation, this is a comprehensive work designed for use by raptor researchers, conservationists and natural resource managers. Discusses field study techniques, physiology, pathology and toxicology in raptors, population monitoring, captive breeding, rehabilitation, etc.

ISBN-978-0888396396
Paperback, 463 pgs. \$70.00



Wild Chinchilla Night Viewing

By Amy L. Deane¹ and Bharath Ganesh-Babu²
Volunteers with Save the Wild Chinchillas, Inc.

Atop a ladder, which has all four legs in buckets of water to deter poisonous critters from reaching me, I await nightfall. After a decade of studying wild chinchillas, I still have really not seen one. It's part of their natural history that makes these little mammals hard for researchers to observe. They are nocturnal perhaps to escape some predation pressures or to avoid the heat of the hot arid days here in these cacti-covered transverse mountains of north-central Chile. Tonight, I am not only nocturnal, but am armed with Russian defense technology (infrared night vision binoculars). I have never been close enough to describe the chinchillas' behavior in detail. However, the locals assure me that if I just try this one spot I will see the elusive endangered chinchillas up close and personal. So, I sit and wait for nightfall.

Tonight seems like all other nights out in the mountains - cold, very dark and peaceful. The first two animals detected are European rabbits (*Oryctolagus Cuniculus*), an exotic nightmare. At 2140hrs a rustling noise starts in the bushes behind me, but I keep the binoculars focused on the stone fence ruins where the chinchillas are living. Every couple of minutes, I turn the lens toward the noise but



Typical chinchilla lanigera ecosystem

detect nothing. The noise is off a little further, but now upslope and to the right. Once again I turn the lens and see nothing. I know something is stalking me and I am hoping with all my might that it's not a puma (*Felis concolor*). I have seen their tracks in this basin but I reassure myself that cats are quiet. It's 2150hrs and no chinchillas. At 2200hrs the noise is getting louder as the animal approaches from the right. It skids to a stop. Relieved that whatever I am going to see has not yet attacked, I turn the binoculars and see a pair of large green eyes that belong to a very skinny fox that is gazing up at me. Instead of being scared, I find myself laughing at the little one. Poor guy, no wonder he's so skinny; I heard him coming for 20 minutes. Also, this is probably why I still have yet to see a wild chinchilla. The fox walks down toward the trees and marks the closest one with urine. By the time I have refocused on the chinchilla colony, the fox has returned but now to my left. I watched the fox watch me for a couple of minutes. He turns his head vertically to look at me as if he is unsure of what he sees. It is a chilla fox (*Pseudalopex griseus*). This species is the smaller of two fox species found in the area and both prey on chinchillas. When hiking, I usually stop to watch foxes. They also pause for a second when they first detect my presence and then they run off. Tonight, I glance down at this fox and decide to move up the ladder one more step to avoid the nuisance of having to go though yet another set of rabies shots. Not that I really think he will bite me. He leaves.

I turn the binoculars back to the ruins and watch for another hour and 50 minutes. My spirit was

dampening; I was never going to be able to study wild chinchilla behavior. I could live just making habitat. I could find their feces, get their footprints, and even hear them occasionally, but I wanted to see them. Not only for scientific purposes, but for my own personal satisfaction. By 2250hrs I had given up on seeing a chinchilla. Tonight was going to end as all other nights, more data on non-chinchilla species.

At 2255hrs, two little green flashes of light appeared in my binoculars. I blinked to clear my vision. It was the left eye of a small animal. The animal hopped twice, and paused upon a large rock for a few seconds. It stopped long enough for me to focus in on the tail. And this time, the tail was long and bushy. It was a chinchilla - a wild chinchilla! My neighbors were right. I could see the entire body and ears of an adult chinchilla. Then it hopped to a small bush where another adult chinchilla was sitting. The eyes were opening and shutting and the animals appeared to be rolling. At least one of them was taking a dust bath. Chinchillas love to roll in dirt. It keeps their fur clean and is insulating. Other self-grooming behaviors include face washing with the fore paws and scratching by a claw in the inner digit of the hind legs. Another very small chinchilla hopped down from the origin of the first chinchilla and joined the other two chinchillas at the meeting bush. When the baby reached the first two, they greeted each other by smelling the nose-mouth area and then one of the adults groomed it. This greeting is classic for chinchillas. Not only does this behavior identify individuals, but also may be an act of submission and probably helps to maintain social bonds because greeting individuals participate in allogrooming. Grooming sessions can last for minutes and may lead to sexual acts. As with everybody, chinchillas love to be groomed when they want to be groomed. In general, they are not like a dog that loves to be cuddled. They prefer to be scratched under the chin and near the ears.



A wild chinchilla visits Dr. Jaime Jimenez during field study. (Photo: Dr. Jaime Jimenez)

In captivity, females control sexual behavior. Males vocalize and wag their tails to get the attention of a female. Once a male has mounted a female, she usually moves before he has completed copulation. If the male does not leave her alone, she may stand up on her hind legs, chatter her teeth and spray him with urine.

Their reproductive biology is why chinchillas have not been able to quickly recover from endangerment. Like many endangered animals, chinchillas have a small litter size, long period until they reach sexual maturity and a long period of gestation. Thus, they are not able to undergo rapid population growth. Chinchillas' gestation period lasts 111 days. One or two young are born eyes open, fully-furred and active or precocial. Sexual maturity is around eight months. Females can have up to two litters per year. When compared to other rodents, chinchillas have a long gestation periods resulting in few offspring. Neonatal weight of chinchillas is 35 grams [~1.24 oz.] (Weir, 1974). Length of lactation is six to eight weeks (Redford and Eisenberg, 1992). The breeding season for chinchillas is at the onset of spring in Chile (Hayssen, Tienhoven & Tienhoven, 1993). Since Reserva Nacional Las Chinchillas was established 24 years ago, the species has not re-established itself. Populations within the reserve continue to decline without clear explanations (Jimenez, 1994).

Many people who have pet chinchillas notice that chinchillas urinate in a particular corner of their cage or play area. The domestic chinchillas that I care for have a common playroom. One group plays for a while and then I place them in their cage and let another group play. Individuals are

grouped by allowing any chinchilla to play with any others as long as no fights break out. It has been my experience that all family members can be grouped together for about the first two years of a juvenile's life. In fact, juveniles can play with almost any group for the first couple of years. At this age, if the juvenile is male, other adult males including his father will start to fight with him. They probably perceive a young male as sexual competition. However, related females seem not to show aggression toward each other. This does support the assumption that in the wild young males disperse out from their natal colony.

Also during playtime, I have noticed that all the males and some females (but to a lesser degree) spend an enormous amount of time smelling the urine left by others. This probably relays information on the identity and reproductive state of individuals. This may in fact be a territorial marking. Exactly how chinchillas allocate defended space in the wild is unknown. I have never read any reports of chinchillas using scent markings to define territories but I believe it is highly possible. One night at playtime, Squash spent an extended period of time smelling a previously marked area. He then lifted up his forepaws, scooted forward in a crouched position and marked the area of interest with no more than five drops of urine. Even after a decade of playtime, I am still amazed by what I learn from these guys. Three years back, two female *Octodon degus* came to live with us - the chinchillas and me. Thus, I am unsure if Squash marked upon a chinchilla or a degus scent. Either way, it's very interesting because wild degus and chinchillas can be found under the same bushes.

They share space by allocating time. Degus are active during the day and chinchillas are active at night. In captivity, most interactions between these two species are neutral but negative interactions consist of a male chinchilla pouncing upon and sometimes biting a degus. Then the chinchilla bounds away and sometimes the degus will chase after it in rage. The female chinchillas seem to be more accepting of the degus. On occasion, degus and chinchillas will groom each other. In the wild, both newborn chinchillas and chinchillas rats (*Abrocoma bennetti*) have been found in the same nest.

The wild chinchillas I was observing were out of sight for a couple of minutes and I searched for any circles of green lights to appear. A juvenile chinchilla hopped down from the fence top past the rock and towards a bush off to the right. Upon its arrival, it quickly changed directions and ran upslope to the right. Another small juvenile chinchilla was chasing it. Although this may have been a real dominance displacement and even territorial defense, it appeared to me as though they were playing. Either way, the games of childhood prepare one for adulthood.

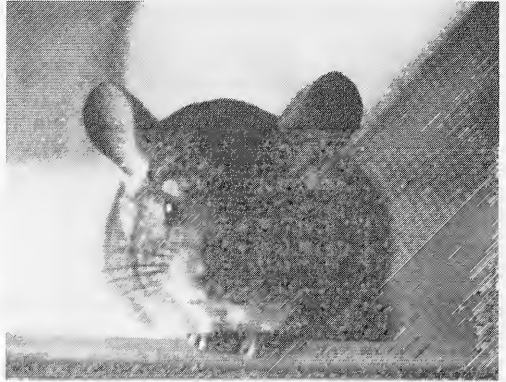
Chinchillas have a variety of defense mechanisms. A basic one is to flee. They flee not only from predators but also from other more dominant chinchillas. In the wild, land tenure is vital for survival. Each animal needs a territory that contains enough food and shelter. For all of these, wild chinchillas will fight fiercely. Entering another's area may even lead to one's death! Upon rediscovery of wild chinchillas in the 1975, researchers began to study the population. Connie Mohlis was live trapping and releasing animals to obtain a population estimates, and Jaime Rodriguez reported on one particular event. Upon release, a chinchilla entered a nearby burrow. Unfortunately, another chinchilla was already taking up that space. A violent fight broke out. The intruding chinchilla eventually died from wounds inflicted during this fight.

Chinchilla pet owners may notice a frisky hop form of locomotion. We see this and interpret as the animal being really excited and happy. According to Dr. Devra Kleinman, this rapid hopping movement with many twists and turns is probably derived from trying to confuse predators and escape predation. If unable to get away, a typical defense response begins with the animal standing up on its hind legs. Dr. J.F. Eisenberg writes that this has two motivations: 1) it makes the individual appear larger and 2) it adds confusion to the intruder by adding a contrasting pattern to the situation. When standing, the animal often vocalizes showing off their piercing teeth. Now a chinchilla has a

couple of options. Sometimes, when a chinchilla is not threatened but annoyed it may use its paws to push away the nuisance and emit a brief grunting noise. If really threatened, an airborne urine attack is a specialty of both sexes and may be accompanied by the release of odors from the anal glands. If urinating has not deterred the opponent, those razor sharp incisors will bite the threatening animal. If the adversary chooses to bite the chinchilla, it better get a deep grip all the way to the skin or the chinchilla will just release its fur and hop away.

Later in my nighttime observations, an adult was hopping down the slope from the same location where I last detected the escaping juvenile. The adult hopped about five meters and stopped. Then the juvenile hopped down and met the adult. The larger one then hopped another five meters or so and once again stopped and waited for the youngster. This was repeated countless times and they were using the same paths. One of the paths ends or begins at an opening in a large bolder crevice. The adult entered the rocks but the baby stayed out, hopping to a nearby large rock down slope and left of the entrance. Domestic chinchillas and their offspring have almost constant vocal contact. I was too far away to hear the wild ones. However, it's not too hard to imagine that the adult and young wild chinchillas were communicating by visuals as well as by auditory means.

In the north/south facing drainage basins, from what I have seen so far, the prey species wait until the moon passes over the mountain before they come out. For this is when their area of activity is in full shade by the facing mountain. Otherwise, they are active before the moon rises over their mountains. Tonight was the first time I was trying to observe chinchillas in an east/west facing drainage basin. The appearance of the moon over the mountain range to the east dampened my hopes, but to my great surprise, one chinchilla was still within sight under the meeting bush.



Ben, domestic chinchilla

I heard no less than 100 gunshots in the last hour. People had begun to hunt rabbits about two kilometers away. The gunshots must have stressed the burros and one started to bray. It was at least a kilometer away, if not two, but the chinchilla was alerted. It stopped what it was doing and stood up on its hind legs, and listened.

A little later, an adult was eating dried grass, their preferred food, in an area just down off the stone ruins. A meter to the left was a break in the fence wall. A trail crossed the fence line at this point. The chinchilla was on my side of the fence down to the right. From atop the ladder I could see the entire drainage basin down past the fence, but from where the chinchilla was it could not. About five minutes passed and then a different type of eye appeared. It was just past the break in the fence and to the left of the trail. I was frightened for the little chinchilla. The new eyes belonged to a flying animal. The animal flew up into the sky two meters and then returned to its original place. It repeated this twice. Was it an owl? Was it stalking the chinchilla? I have seen great horned owls, (*Bubo virginianus*), perched on the ground.

After two minutes, the chinchilla stopped eating and hopped to the left toward the other eyes. I could see the new pair of eyes through the left eyepiece of the night vision binoculars and the chinchilla through the right lens. The chinchilla stopped at the onset of the trail behind a rock. It then stood on its hind legs and looked over at the eyes. The chinchilla knew right where the animal was located. It must have used its big ears for that. It took a glance and then hopped right past it. The chinchilla knew that the other animal was not a threat. The eyes belonged to an insectivorous nocturnal bird, the band-winged nightjar (*Caprimulgus longirostris*). I was awestruck at the nocturnal activity here in the desert wilderness. Not only did I get to really see wild chinchillas, I also learned

that they knew whom not to be afraid of. I did not expect to witness non-predator recognition by a chinchilla, at least not the first time I really saw the wild ones.

Editor's Note: You may wish to read and reference an earlier article by these two authors published under "Notes from the Field" (A Guide to Grassroots Conservation Practitioners: Experiences from Long-tailed Chinchilla Conservation in Chile) that appeared in the June 2007 (Vol. 34, No. 6) issue of *Animal Keepers' Forum*, pages 229-235.

¹Amy L. Deane is President of Save the Wild Chinchilla, Inc. (SWC), a 501 (c)(3) nonprofit conservation organization located in Indiana.

²Bharath Ganesh Babu is an Instructor in the Department of Geography and Meteorology at Valpariso University, Valpariso, IN and a volunteer with SWC.

(Photos by the author unless otherwise noted)

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The papers, posters and workshop summaries from the Galveston, TX 2007 National AAZK Conference are now available to download from the Member's Only Section of the AAZK website (www.aazk.org). They are available either as a complete download of all materials or as individual papers in pdf format. Proceedings will not be published in hard copy, so this will be your only way to access these materials. We hope to have the papers from the 2008 AAZK Conference in Salt Lake City available for download on the site soon - watch for announcements on the website and in *AKF*.

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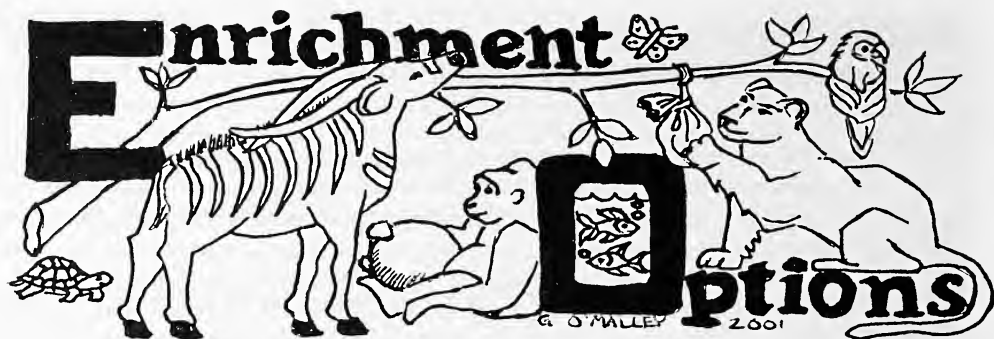
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EO Editor - Rachel Daneault, Disney's Animal Kingdom

Lee Houts Excellence in Enrichment Award

Two Lee Houts Excellence in Enrichment Awards were presented at this year's National AAZK conference. The EO Column would like to highlight the achievements of both winners. This month we would like to recognize the Volunteer Enrichment Team (V.E.T.) at the Oregon Zoo. This team was nominated by the Marine Life staff for their hard work on enrichment initiatives at the zoo. This group of individuals averages between 70-200 members with one volunteer serving as the V.E.T. team leader. This group does all of their own coordinating, creating, designing, building and distributing of enrichment items. They are a flexible, well-organized group who are easy to work with. The V.E.T. group works with several different departments within the zoo including, but not limited to, living collections, the vet department, exhibit design and media relations.

Their focus is on increasing enrichment opportunities for any and all animals at the zoo. The increased environmental enriching activities cover a wide range from a delivery of ice shavings from the local ice skating rink (snow) to creating all of the enrichment for a weeklong "Spring Break" event. Last year, this group volunteered over 4231 hours.

The V.E.T. is also creative in obtaining items for enrichment. Many have connections throughout the community and receive donations or discounted prices on a variety of items. The V.E.T. is creative in obtaining items for enrichment. Many have connections throughout the community and receive donations or discounted prices on a variety of items.

Example of V.E.T. work:

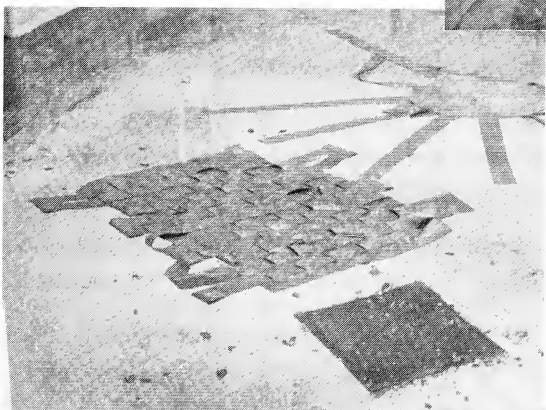
Car wash material and burlap - The V.E.T. creates patterns for various shapes and objects and then stitches the pieces together to create 3-D enrichment items. A few examples of items that have been created, sewn and offered have been: a 3 1/2- foot tall globe, snow flakes, four leaf clovers, leprechauns, a SCUBA diver, themed-characters, a jellyfish with feeding pouches, pirate hats, an octopus, a squid, etc. See photos on next page.



Creativity

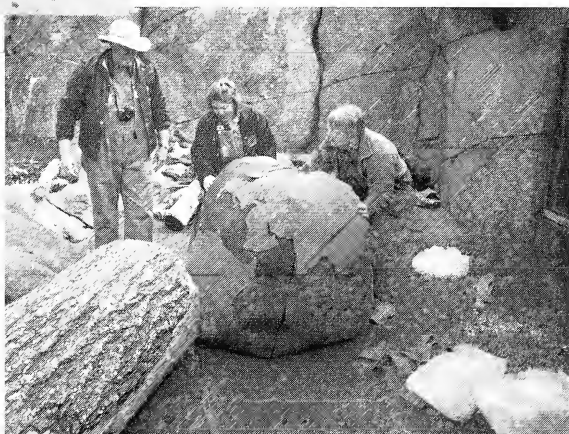


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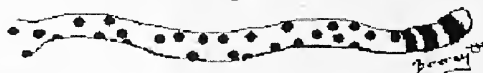
Enrichment

Items



The Behavioral Husbandry Committee Presents

Training Tales...



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*Training Tales Editors – Jay Pratte, Zoo Atlanta; Kim Kezer, Zoo New England;
and Angela Binney, Disney's Animal Kingdom*

Teaching Old Birds New Tricks: Reducing Aggression in 1.2 Hyacinth Macaws

By

*Catherine Vine, Bird Keeper, The Philadelphia Zoo
AAZK Behavioral Husbandry Committee Member*

The Philadelphia Zoo currently houses 1.2 Hyacinth macaws (*Andorhynchus hyacinthinus*). These birds arrived at the zoo in April of 2000. I became the primary keeper for them in April of 2005. This article will outline the steps taken to reduce aggression in all three birds, as well as improve their reliability with shifting on and off exhibit.

Background Information

All three of our hyacinth macaws were donated to the zoo by a private owner. The first pair of macaws, "Jessie" and "Jasper", hatched in 1985. At the point I began working with them, they were already 20 years old, and had been through several owners. The third macaw, a female, is named "Babe." She was hatched in 1992, and was 13 years old when we started training. In 2005, when we began this program, Babe had begun picking her feathers. One of our goals with our new training program was to reduce her aggression in the hopes of also decreasing this self-destructive behavior.

The prior macaw keeper had already begun a training program with these birds. They were trained to go to different perches within their indoor enclosure. However, the training was not done on a consistent basis, so the behavior was not very strong. Also, both female birds were extremely aggressive towards keepers. They would both run along the bottom of their cages in an attempt to grab keepers as they walked by. Keepers were unable to enter either the indoor or outdoor enclosures safely to change enrichment or clean. All cleaning was typically done from outside the cage, or when the birds were shifted into a different enclosure. While the male macaw was much calmer and friendlier towards people, he would also attack keepers inside the cage if the female started the attack.

The Training Process

We began the training program with fairly simple goals. Our first priority was to ensure that we would be able to safely enter both the indoor and outdoor enclosures in order to change enrichment throughout the day. Additional goals were to be able to obtain consistent, accurate weights on all three birds to monitor their health; to improve their reliability shifting on and off exhibit; and to crate train the birds in case they needed to be moved or taken to the vet at any point.

The birds did not show much motivation when they had free access to all of their allotted pelleted diet, so we began hand-feeding the birds all of their pellets (the same amount of pellets provided in the free access regime). By hand-feeding pellets to each bird, we ensured that every bird received an adequate daily diet, prevented aggression between the birds in the pair, and created a high level of motivation

for training. All three birds are currently working at or above their “free access” weights. In addition to the hand-fed pellets, the birds have free access to their daily allotment of fruits and vegetables.

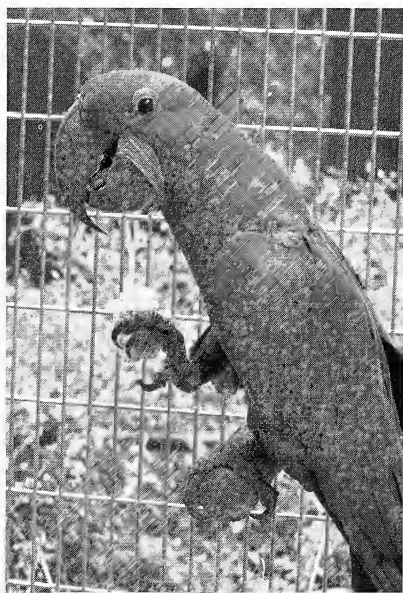
Our second step was to add differently colored concrete perches to the indoor and outdoor enclosures. Each bird was assigned to a perch as a station in each enclosure. We began by reinforcing each bird when it was perched on its station. If the birds showed any signs of aggression towards the keepers or another bird, we ended the session and came back later. Keepers were able to fit multiple, short sessions in each day.

Once all three birds learned to station to their perches, we began moving away from the enclosure, then reinforcing the birds for staying on their stations. This enabled us to increase the time the birds would remain stationed between reinforcers. Eventually, the birds would remain stationed while we changed bowls in their indoor cages, something that was extremely difficult prior to training due to the constant aggression from the macaws. When the birds were stationing consistently in their outdoor enclosures, we began entering the cages. If any of the birds left their station, we exited the enclosure. Therefore, the birds were never able to attack keepers from the ground, as they had previously done.

When all three macaws continued to station reliably while keepers were in the outdoor enclosure, we began hand-feeding them from inside the cage. We began with whole macadamia nuts, since they were larger than pellets. Very quickly, we were able to hand-feed pellets as well; eventually they would even accept sunflower seeds without showing any signs of aggression.

Once the birds were stationing well, we also introduced a scale into their indoor enclosure. They had previously been trained to get on a scale, but it would frequently result in aggression between birds as they competed for a chance to get on the scale. Additionally, they would often attempt to chew on and take apart the scale. We worked on teaching them to remain stationed until they were called individually down to the scale. We also reinforced them for sitting calmly on the scale, and for returning to their stations without destroying the scale. With their increased motivation and calmer behavior towards keepers, the destructive behavior towards the scale decreased significantly (but only after they ruined two scales!).

We decided to introduce crates at this point. We used 300kg “sky kennels”, since we wanted to accommodate their tail length. The crates were attached to the doorways of their indoor enclosures during training sessions, which were just about the same size as the crate entrance. We began by baiting the birds towards the crate as needed, and then switched to reinforcing them for approaching the crate and entering it. All three birds eventually learned to crate, though some were more reliable than others.



Hyacinth Macaw at Philadelphia Zoo

(Photo by Catherine Vine)

As our comfort level with the macaws increased, we decided to try stick-training them, in the hopes of eventually hand-training them. Since all three birds had once been pets, we knew that they had all been held on a hand before. However, during our first training session with “Babe,” she ran up the length of the stick and sat on my arm. Since she showed absolutely no aggression, and stepped off easily onto a perch when called back to it, we decided to skip the stick-training and move directly to working the birds on our hands. In order to make the process safer for keepers, we decided to teach the macaws to hold up their foot prior to being picked up. This enabled us to ensure that we never

attempted to pick up any bird when it didn't want to participate. Both "Jasper" and "Babe" quickly learned to step-up on keeper's hands. "Jessie," however, continued to display aggression towards keepers when we attempted to hand-train her. She took a long time, but just recently stepped-up for the first time. She's now stepping up calmly with no aggression, as are the other two macaws.

Results of the Training Program

We have seen many positive changes in the behavior of all three birds since we began training them. Most noticeably, "Babe" has stopped picking her feathers, and many of the damaged feathers have grown back. All three birds are much calmer, and no longer routinely lunge at keepers.

Since we began the training, we moved all three birds into an entirely new exhibit. The building and outdoor enclosure were originally designed for cats, so the shift doors are all at ground level. We were able to train all three birds to use the shifts to go on and off exhibit. The new outdoor exhibit is much taller than their former exhibit, but the macaws have learned to come down each evening to shift inside. We're now able to enter both the indoor and outdoor enclosures to clean, add and change enrichment, and for training sessions.

We designed a new scale perch that puts the birds up off of the scale top in order to prevent them from destroying it. All three birds can be stepped up onto the scale from the hand. This not only protects the scale, but leads to more accurate weights, since their tails are now clear of the ground. We also purchased a Prevue Hendrix® model 126 cage to use as a crate. This cage is made of stainless steel bars, and the birds are able to sit comfortably on a perch inside with plenty of room for their tails. This prevents feather damage, and also allows the birds to see around them. All three macaws can currently be placed into the cage from the hand.

Overall, the training program has significantly reduced the macaws' aggression towards keepers, and improved our relationship tremendously. We're now able to weigh each bird daily and better monitor their overall health. In the future, we plan to introduce additional keepers to the training program so that more people are able to handle each bird. We're also developing keeper talks that will incorporate some trained behaviors in order to better educate visitors about the care of large macaws and the difficulty of keeping them as pets.

Acknowledgements: Thanks to my co-workers for all their work on this program, especially Kristi Blundetto, Wendy Lenhart, and Paul Kalka.

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Behavior of Female Koalas

(*Phascolarctus cinereus adustus*)

in a New Exhibit at San Diego Zoo

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Abstract

Zoo designs aim to achieve two simultaneous goals: house animals in an engaging manner for the public and promote the natural behaviors of the animals. At the San Diego Zoo, four female koalas, *Phascolarctus cinereus adustus*, were introduced to a new outdoor enclosure. This study monitored their daily activity patterns and enclosure use in relationship to visitor crowd density and noise level. Their highest peak of activity corresponded to the lowest noise level and least dense visitor crowd. The koalas favored perches in the midground and background of the enclosure and were more active in the evening; eating and locomoting more. The results suggest that koalas' habits may be more influenced by temperature and shade availability than crowd levels.

Introduction

Zoos aim to display animals in enclosures that are both engaging to the public and are not disruptive to the natural behaviors and well-being of the animals. Koalas, *Phascolarctus cinereus adustus*, have long been a symbol of Australia and often serve as ambassador animals for conservation and education functions. Many zoos house koalas, but koalas' sedentary and crepuscular habits make it difficult for most visitors to see them active. Studies have shown that koalas will spend 18-20 hours of the day inactive (Sauro and Frank 2004; Richter 2006; Nagy and Martin 1985; Martin and Handasyde 1999).

The koala's constrained activity budget is a result of a nutrient and calorie-poor diet of eucalyptus leaves. Koalas spend much of their time immobile as a result of a prolonged digestion process (Martin & Handasyde, 1999). The natural behavior of the koala conflicts with the entertainment demands of the public.

Koalas are solitary animals by nature (Lee & Carrick, 1989). Yet within a zoo setting, koalas are housed in close proximity to each other and to the public. The purpose of this study was to examine the dynamics between a group of female koalas and the public at the San Diego Zoo. The koalas were introduced to their new public enclosure a month before the study commenced. We monitored koala activity patterns throughout the day in relationship to visitor crowd density and noise level. We hoped to gain a better understanding of a captive female koala's daily activity budget, how the budget changed over the course of the day, and how the females utilized their new enclosure. With this knowledge, we hope to enhance the quality of experience, both for the viewing public and for the koalas living at the San Diego Zoo.

Methods

The study was undertaken at the San Diego Zoo (California). For this study, four female Queensland koalas were introduced to an outdoor enclosure from an off-exhibit indoor area described by Tobey et al. (2006). The public outdoor enclosure measured approximately 12.19 x 15.24 x 1.52m [~40 ft. x 50 ft. x 5 ft.] and contained both vertical and horizontal perches forming interconnected pathways. Open canisters were connected to the anchored perches and were filled daily before 0900hrs with fresh eucalyptus browse. Non-browse vegetation and natural leaf litter covered the floor of the enclosure. An open-sided hut provided shade and a metal awning covered the rear of the enclosure.



Female Koala Exhibit at San Diego Zoo

(Photo by Maressa Takahashi)

The females' enclosure was bounded by a low wall, so they had visual and auditory access to the other koalas living in the other outdoor enclosures, all of whom were male. A wooden bridge terrace for public viewing formed one side of the females' enclosure. All four females were of reproductive age (4-12 years old).

Observations occurred from 0900 to 2100hrs during the hours the park was open to the public. This 12-hour timeframe was divided into four observation blocks of three hours each. A latin square design determined which time block was observed for a given day (Scheiner & Gurevitch,

2001). During each observation time block, instantaneous scan samples on all individuals (Martin & Bateson, 1993) were collected at five-minute intervals. At each interval, the location of each female, the behavior exhibited by each female, the density of guests and the noise level of the environment were recorded. The visitor density was measured by taking a quick count of the number of guests on the walkway, using three categories created from the normal range of crowd density throughout the day. Zero to 25 guests meant that visitors were sparsely distributed on the viewing terrace and most of the railing bordering the koala exhibit was open; 26-55 guests was the most common level of guests and usually meant that guests lined the terrace railing at regular intervals; more than 55 guests meant that the viewing terrace was extremely crowded and the entire perimeter of the viewing deck was solidly lined.

Noise levels were arbitrarily assigned by the observer as "loud" or "not loud," in comparison to the average level of ambient noise. Ambient noises included the visitors, noise from a parking lot adjacent to the exhibit and a continuous, looped informational video playing on the walkway. Locations were subdivided into "foreground," "midground," and "background" based upon distance to the wooden guest walkway and recorded behaviors were classified as "Active" or "Non-Active" (Table 1). Ninety-six hours of observations were made from the public viewing wooden terrace, ensuring that the koalas were not affected by human presence in the enclosure. At the beginning of the study, only three koalas were in the exhibit, as one female was still with her 14-month joey in another exhibit. The fourth female was placed with the other females at the end of the second week of data collection. The study took place over a 12-week period (May 2007 through August 2007) and was part of a project that was approved by the Zoological Society of San Diego's Institutional Animal Care and Use Committee.

Results

The activity budget for the four female koalas showed a pattern observed in both zoos and the wild (Figure 1). The koalas were largely inactive, with peak activity occurring between 1500 and 1800hrs. Almost a four fold increase in the amount of active behaviors displayed by the koalas occurred over the course of the day. The increase in active behavior was primarily a result of an increased eating, comprising 5% and 4% for time blocks 0900-1200hrs and 1200-1500hrs, respectively. Eating increased to 10% during 1500-1800hrs and peaked at 22% during 1800-2100hrs. A five-fold increase in the amount of locomotion was recorded during the day, comprising 1% of all behaviors of the females during the time 0900 and 1800hrs, but climbing to 5% during the last block, 1800-2100hrs.

Over 80% of the time the koalas remained in the mid- and background (Figure 2). The data indicated about a three-fold increase in time spent in the foreground over the progression of the day. Females

Table 1. Female Koala Ethogram

Non-active

“sleep”- head tucked down AND no movement

“rest alert”- head upright OR eyes clearly open; AND sedentary, may be moving limbs, shifting position

Active

“eat”- reaching for foliage, smelling of leaves, consumption of leaves, and/or chewing

“locomotion”- any forward or backward movement of body; can include climbing of tree or between trees; can include hopping among trees

“self-groom”- scratching of body

“bellow”- braying call with a sharp and very audible inhaling followed by guttural wheezing rumbles

“restless” – repetitive locomotion or movement with nonspecific purpose

Other

“unknown”- animal is not within view or behavior cannot be determined

“other”- any other behavior not listed in above categories

also had preferences for certain perches. Each female spent more than 75% of her time on six or fewer favorite perches.

There was an increase in both the number of people and the noise level during the time block 1200-1500hrs (Figure 3). The lowest density of crowds and noise levels was during the last time block, 1800-2100hrs.

Discussion

Female koalas spent 80-90% of their time in a “Non-Active” state, which is consistent with published activity patterns of koalas living outdoors and indoors (Sauro and Frank 2004; Richter 2006; Nagy and Martin 1985; Martin and Handasyde 1999). Their highest peak of activity corresponded to the lowest noise level and least dense visitor crowd. The koalas spent the majority of their time in the midground and background of the enclosure and were more active in the evening, eating and locomoting more. Finally, females favored perches that were in the mid- and background.

This preference for the mid- and background may be explained by the greater amount of shade, browse, and perches available to the koalas in those areas. The koalas tended to venture into the foreground in the evening when it was darker and there were fewer crowds. However, we cannot know if koalas were moving into the foreground in the evening because of the cooler evening temperatures or because they were discouraged by the daytime crowds. Shade and temperature regulation may have more to do with their habits than the influence of crowds. In Australia, use of shade trees during the daytime is a major factor affecting inactivity and ranging behavior (Pfeiffer et al., 2005).

In addition, one of the females spent 55% of her time on a single perch in the back of the enclosure. That particular perch is always shaded and happens to overlook the zoo parking lot. It is assumed that she is not disturbed by crowds because she chose to spend half of her time there, even though the perch is exposed to passing crowds in the parking lot, driving cars and buses, and car horns and

alarms. Also, the koalas had favored perches and these highly utilized perches are located under the hut and awning, where there is ample browse and shade throughout the day.



Maressa collecting data from the public wooden bridge terrace.

(Photo by Jennifer Tobey)

Ideally, the koalas should spend the most time in the foreground of the enclosure where they are most visible to the public. Our data hint that koalas choose their perches by available shade and browse, which mimics the pattern recorded in the wild. Keepers may be able to adjust the amount of shade in the enclosure so that the koalas are tempted to spend more time in the foreground during daylight hours, making them more easily enjoyed by the public.

The increase in activity level throughout the day was a result of higher levels of eating and locomotion in the evening. It might be expected that the highest amount of eating and locomoting should occur early in the morning, when the eucalyptus browse was freshest. However, the opposite pattern suggests that koala activity may be related to the decreasing intensity of sunlight and cooling temperature and that the timing of presentation of browse does not influence their activity state.

Another assumption is that zoo guests prefer to view the koalas when most active. Following this assumption, we would expect the highest number of guests to correspond to the time when koalas are most active, the evening in this case. However, we found crowds to be densest in the middle of the day. This suggests that guests either do not plan their viewing habits around animal activity levels or guests are not informed when it is best to view koalas. To better facilitate a quality experience for guests, it is suggested that information be available to guests detailing the daily activity patterns of koalas.

The results of this observational study suggest direction for future studies to better understand captive koalas' activity patterns and their relationship to zoo guests. Additional studies should precisely assess both visitor crowd density and noise level for a more accurate pattern of crowd behavior. Also, the observations should extend to the weekend zoo hours, where crowd levels are undoubtedly higher and might elicit responses from the koalas. Temperature should also be monitored during future studies so that weather patterns can be compared to the activity patterns of the females. By following their movements and preferred locations, animal care staff can adjust the enclosure to maximize their comfort and at the same time make them more visually accessible to the public.

Acknowledgements

We want to thank Dr. Fred Bercovitch for his support, guidance and feedback, and Carmi Penny for facilitating our work. We also thank the koala keepers: Amy Alfrey, Jennifer Moll, Jennifer Roesler, and Rochelle Willison for their assistance, advice and enthusiastic cooperation. The CRES Neeper Summer Student Fellowship Program provided financial support. We extend our appreciation and thanks to Rita and Josiah Neeper for funding the summer internship.

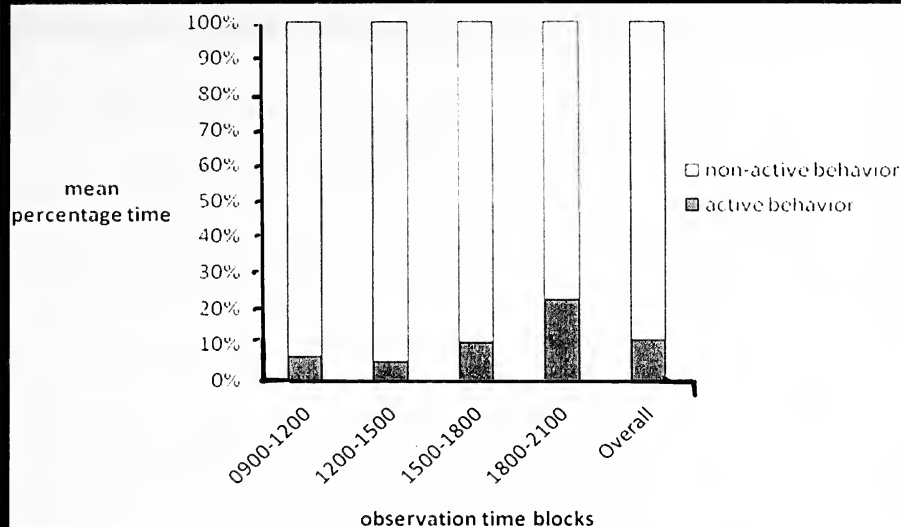


Figure 1. Daily mean activity budget of active and non-active behaviors

Fig. 1 - Daily mean activity budget of active and non-active behaviors

Compilation of female koalas' data (N=4). Data was averaged for each three-hour block and for a general time budget 0900-2100hrs.

Active behavior=eat + locomotion+bellow+self groom,

Non-Active behavior= sleep+rest alert+other; restless behavior was not witnessed

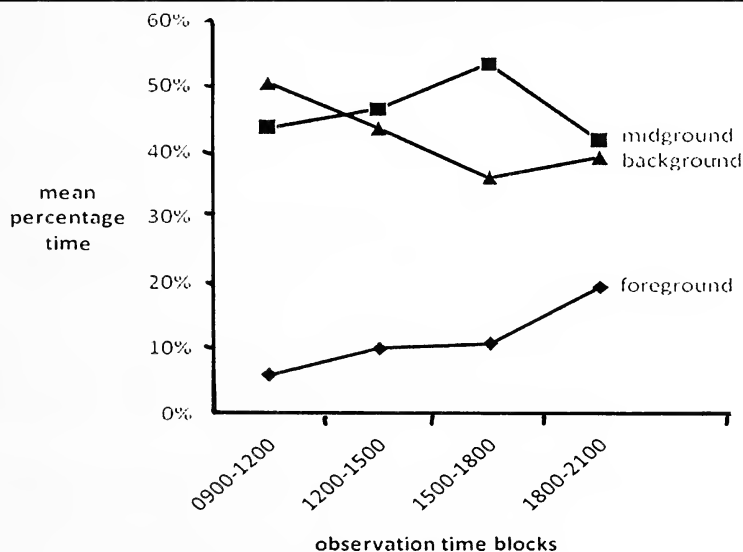


Figure 2. Daily mean of proximity of koalas to viewing terrace

Fig. 2 - Daily mean of proximity of koalas to viewing terrace

Data was averaged for each 3 hour block (N=4). Foreground, midground, and background represented equal portions of the enclosure. Foreground was closest to the viewing terrace and the contained the fewest perches and browse. The midground and background contained equal amounts of perching and browse.

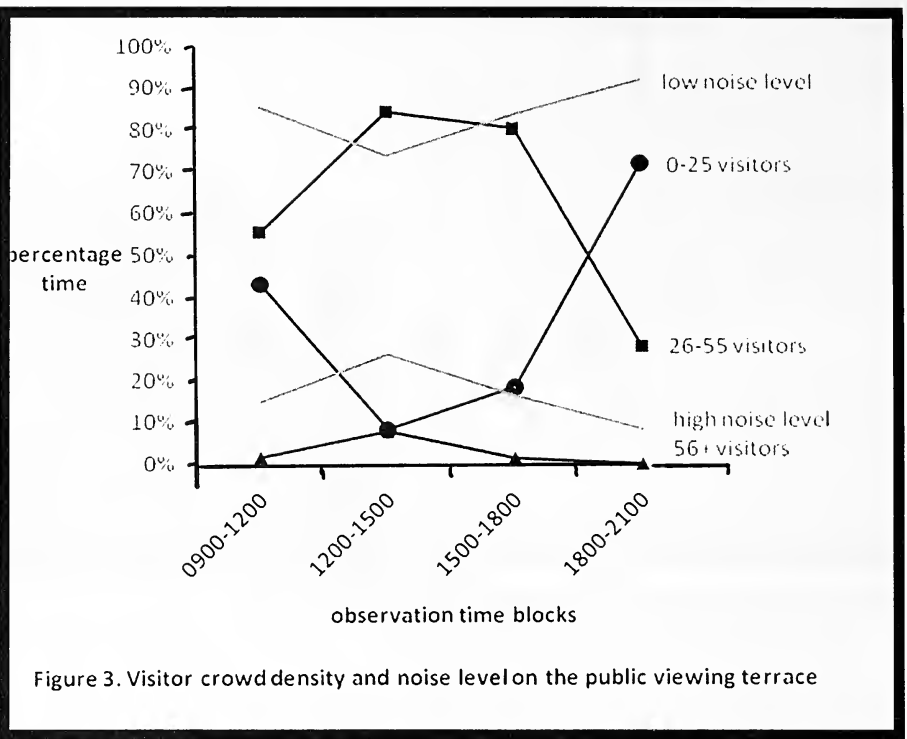


Figure 3 - Visitor crowd density and noise level on the public viewing terrace
Percentages were determined by summing all data for a time block.

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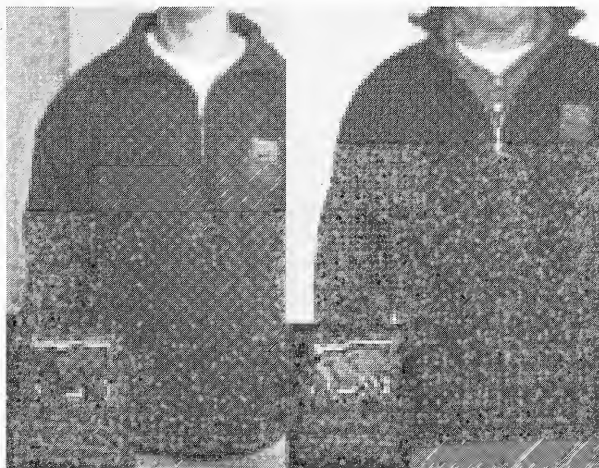
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Conservation/Legislative Update

Column Coordinators: *Becky Richendollar, North Carolina Zoo*
and *Greg McKinney, Philadelphia PA*

*This month's column was put together by
column co-coordinator Becky Richendollar*

Editor's Note: Last month's column was put together by column co-coordinator Greg McKinney and this was not acknowledged in the November 2008 issue of *AKF*. Our apologies.



Cats on a Plane - A baggage worker at Delta airlines got a surprise in late October when she found a cheetah (*Acinonyx jubatus*) running loose in the luggage area. Two cheetahs were being flown in the cargo section of a passenger flight from Portland, OR to Atlanta, GA when one of the animals escaped from its cage. The escaped cheetah did not damage any of the luggage on the plane, nor did it cause harm to any passengers. The airline requested assistance from Zoo Atlanta and zoo officials came to the airport and darted the escaped animal. The two animals then went to Zoo Atlanta. Both of the one-year-old female cheetahs were on their way to the Memphis Zoo in Tennessee. After an unexpected layover at Zoo Atlanta, the cheetahs were looking forward to an uneventful flight to Memphis. *Source: The Associated Press, 10/31/08*

Rare Reptile Rediscovered in New Zealand - A reptile with ancestors that date back to the dinosaurs has been found on the New Zealand mainland for the first time in 200 years. Four leathery, white eggs from a tuatara (*Sphenodon punctatus*) were found at the Karori Wildlife Sanctuary during routine maintenance work.



(Photo Robyn Grant/iStockphoto.com)

Rouen Epton, conservation manager said, "the nest was uncovered by accident and is the first concrete proof we have that our tuatara are breeding."

Tuatara are dragon-like reptiles that can grow up to 32 inches in length. They have unique characteristics including two rows of top teeth that close over one row of bottom teeth. Tuataras also have a light-sensitive pineal gland on the top of their skull. This white patch of skin, referred to as a "third eye" slowly disappears as the animal matures.

A native New Zealand species, tuataras were nearly extinct on the country's main islands. A population of 70 was brought to the Karori Sanctuary in 2005, and another 130 were released into the sanctuary in 2007. The eggs found were immediately covered back up to avoid disturbing the incubation process and Epton hopes to see them hatch early next year. *Source: Associated Press, 10/31/08*

Little Rock Zoo Says Goodbye to JJ - A 21-year-old silverback western lowland gorilla (*Gorilla gorilla*) died in November at the Little Rock Zoo. JJ appears to have suffered from a heart condition. Earlier in the year, tests showed that JJ (short for Jungle Jack) was living with congestive heart failure, a common disease in captive adult male great apes. Marilyn Baeyens, the zoo's veterinarian, said that JJ's heart was functioning at 10% of capacity. JJ was born at the Columbus Zoo and had been living in Little Rock for the last 15 years. *Source: Associated Press, 11/03/08*

Injured Flamingo Recovers, Returns to Flock - Although still a little unsteady on its legs, a flamingo who had been beaten earlier this year by some visitors at Adelaide Zoo returned to its enclosure well on the way to recovery.

The half-blind greater flamingo (*Phoenicopterus roseus*), one of the oldest known greater flamingos in the world at over 70 years of age, was beaten around the head and beak during an attack in October.

Four young people, ranging in age from 17 to 19 have been charged with animal cruelty. Greater, as the injured flamingo is known, was returned to its companion, a Chilean flamingo (*Phoenicopterus chilensis*) that has lived with him for the past 50 years. The flamingos' keepers feared for the health of the Chilean flamingo if Greater did not survive the attack.

The docile animals have long stayed at the edge of their open-air enclosure, allowing the public to photograph them. Zookeepers said they did not know if Greater's beating would cause the birds to hide from visitors. Greater arrived at the Adelaide Zoo in the 1930s, followed by his Chilean companion a decade later. *Source: The Australian, 11/01/08*

Milwaukee Zoo Fishes Out Fallen Bear - A polar bear (*Ursus maritimus*) fell into a dry moat around his exhibit at the Milwaukee County Zoo in mid-October. After more than two weeks of being in the moat, zoo officials fished the fallen bear out of the moat with a crane.

The bear, known as Zero, was playing with a toy when he tumbled off the edge of the exhibit and landed on a net a few feet above the dry moat floor. Zoo officials cut the net at that time, letting Zero down safely. Zoo workers had hoped that the 19-year-old polar bear would use a nearby stairway to climb out of the moat, but he stayed in the moat. The zoo tried to lure Zero with treats, and had cut his normal diet to try and force Zero to get himself out of the moat.



(Photo: Milwaukee County Zoo)

When those efforts did not pay off, zoo officials anesthetized the 1,100 lb. bear and physically pulled him out with the crane. Zoo Director Chuck Wikenhauser said that veterinarians confirmed that Zero had no injuries when he was lifted out of the moat. This same bear had fallen into the moat 15 years ago, but was able to get himself out after nine days. Keepers will continue to monitor Zero and talks will begin on possible exhibit modifications.

Source: Associated Press, 10/20/08

Australian Boy Causes String of Deaths at Zoo - A seven-year-old boy broke into a zoo and fed many of its animals to the zoo's saltwater crocodile (*Crocodylus porosus*). Security camera footage from the Alice Springs Reptile Centre shows the smiling boy as he led or fed several animals into the jaws of the croc. A turtle, four western blue tongue lizards (*Tiliqua occipitalis*), two bearded dragons (*Pogona vitticeps*), two thorny devil lizards (*Moloch horridus*), and an adult female Spencer's goanna (*Varanus spenceri*) were fed to the 440 lb crocodile named Terry.

Footage also showed the boy bludgeoning to death two more thorny devils and a small blue tongue lizard. Centre director Rex Neindorf reported that the police had located the boy but that "in the Northern Territory here he can't be accountable if he's under 10 years of age."

Neindorf went on to say that several of the animals killed were rare and will be difficult to replace.

The child wouldn't talk when questioned by police, so the motive for the rampage is unknown. Neindorf said he may sue the parents of the boy, who were with him at the time. The boy, Neindorf pointed out, could easily have been eaten by Terry as he fed the animal. *Source: Reuters, 10/03/08*

Elephants Out for a Walk - Researcher Michael Rowe is studying how elephants, that can't sweat or pant, deal with heat and cold. With the cooperation of four zoos in the United States and Canada, Rowe hopes his research will have implications for helping wild elephants in this era of climate change.

Jeff Andrews, animal care manager for the San Diego Zoo and the San Diego Wild Animal Park, said "the more we can learn about this very important component of large herbivore biology and elephant metabolism and biology, the more we can apply to the quest for conservation.

Andrews also said that wild elephants can handle extreme temperature changes, between seasons, and even between day and night. Knowing more about how they handle these temperature swings might help zoos provide better and more appropriate enclosures for the captive elephant population. Andrews said that Rowe's work might lead zoos to better understand when they need to add heat to an elephant enclosure, and when it is time to offer mechanisms for the animals to cool off.

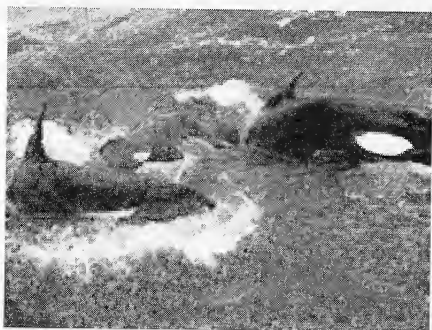
Rowe walks with the elephants in his study twice each day – before and after the zoo closes. Strapped to the animal's leg is an accelerometer which measures stride length, frequency, and speed. Rowe calls it a "very expensive pedometer", and says, "it's actually meant to measure stresses on automobiles, aircraft, things like that."

At the start and finish of each walk, Rowe takes thermal energy images of the animals, as well as temperature readings through a home-made rectal probe. The elephants receive treats for participating in the research, and Rowe says they seem to enjoy the exercise and the opportunity to be social.

Rowe hopes his research will conclude in the spring of 2010 and will include 50-60 total elephants.

Source: Associated Press, 11/05/08

Baby Killer Whale Born in Japan - A killer whale (*Orcinus Orca*) that was born and raised in captivity at an aquarium in Japan has given birth to a baby - a first for that country. "Lovey" gave birth at Kamogawa Sea World and reportedly the baby is healthy and swimming with its mother. Breeding killer whales in captivity is very difficult and having one born to a captive-born female is unusual.



(Photo:Kamogawa Sea World)

The baby measured about two meters in length and was estimated to weigh between 160-180 kg. Its gender is unknown at this time. It had also not been named as of this writing.

The mother was born at the aquarium in 1998. She was found to be pregnant two months after mating with a male killer whale named Oscar, at the aquarium in April of 2007. Source: www.chinanews.com 10/03/08

Hunters Help Feed Zoo Animals - The Alaska Zoo has recently repositioned itself as a cold-climate conservation park, following years of controversy surrounding the housing of an African elephant (*Loxodonta africana*). The Board has now focused the zoo's mission to involve the conservation of arctic, sub-arctic, and like-climate species.

And being able to feed the zoo's tigers, bears, lynx, and wolves prey native to the area is helpful to the zoo. That is where the hunters come in. Pickup trucks come to the zoo and leave behind plastic bags full of bones, sinew, and various leftover parts of the game they bring home.

In 2007, roughly 1,500 Anchorage residents harvested more than 1,600 Alaska big game animals. Many hunters roamed far outside Anchorage, bringing only the meat back to the city. But some carcasses end up in town. By law, hunters can't put the leftovers in the curbside garbage bin. Historically, hunters dropped off the carcasses at the landfill, but now a new option is the zoo.

At the height of hunting season the zoo can get up to two drop-offs from hunters a day. "We rely on it," said zoo keeper Stephanie Hartman, "each season we get stuff in, it will last us to the next season."

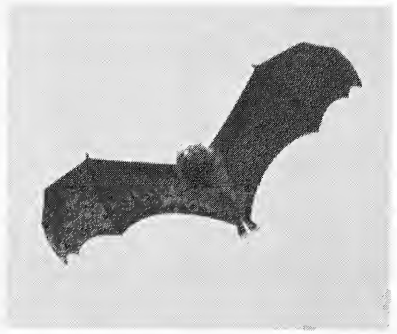
Source: Anchorage Daily News, October 26, 2008

Bat Thrives After Close Call with Extinction - The Pemba flying fox (*Pteropus voeltzkowi*), a fruit bat with a wingspan of more than five feet, has made a comeback from the brink of extinction. A

native of Pemba island off Tanzania, the bat was down to just a few specimens in the late 1980s and was listed as critically endangered.

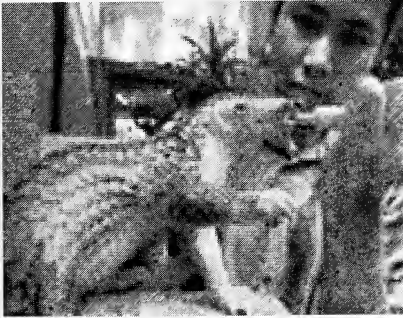
The large bats suffered habitat loss, as well as being hunted and eaten all over the island. Two new forest reserves were created, and conservations sought to reduce hunting by raising local awareness about the possibility of ecotourism because of the bat.

The bat's numbers are now at least 22,000 with some estimates reaching as high as 35,600. "Today, Pemba flying foxes are much loved by islanders," said Fauna and Flora International, "with local people helping to protect the bat through community-led 'Pemba flying fox clubs'." The bat has been downgraded to a "vulnerable" listing on the IUCN Red List. Source: msnbc.com, 10/31/08



(Photo: E. Bowen-Jones/Fauna and Flora International)

Malaysian Police Seize 42 Live Pangolins - Malaysian marine police detained two Indonesian men and seized 42 live pangolins (*Manis temminckii*) from their boat during an anti-smuggling operation in the straits of Malacca in late October. The suspects were believed to have brought the pangolins from Bengkalis in Indonesia's Sumatra Island for sale in Malaysia's southern Johor State.



Malaysian Wildlife personnel care for rescued pangolins (Photo: Y. Sherati)

The animals, which are highly priced on the black market for their flesh, have been valued at more than \$30,000 US. The confiscated animals were turned over to the state's Wildlife Department.

The men have been remanded for investigation and will be charged with smuggling a protected animal species. (Source: www.Stardaily.com 10/20/08)

Virgin Shark Pregnancy - Scientists using DNA testing have confirmed the second-known instance of "virgin birth" in a shark -- a female Atlantic blacktip shark (*Carcharhinus limbatus*) named Tidbit that produced a baby without a male shark. The shark came to the Virginia Aquarium & Marine Science Centre in Virginia Beach not long after being born in the wild and had lived there for eight years with no males of the same species, said Beth Firchau, the Curator of Fishes.

The five-foot (1.5m) shark died after being removed from her tank for a veterinary examination, and a subsequent necropsy revealed that Tidbit was carrying a fully-developed pup nearly ready to be born. Virgin birth is known as parthenogenesis. The only other recorded incident of such a virgin birth in sharks was in a hammerhead shark (*Sphyrna Lewini*) at Omaha's Henry Doorly Zoo that gave birth to a pup in 2002.

Parthenogenesis has also been documented in Komodo dragons (*Varanus komodoensis*), snakes, fish and amphibians, according to Dena Chapman, a shark scientist with the Institute of Ocean Conservation Science at Stony Brook University in New York who performed the DNA testing that showed Tidbit's pup had no father. Source: Reuters.com/Matthew D. Potenski 10/10/08

Chinese Workers Impacting Elephant Poaching in Kenya - Chinese workers rebuilding in northern Kenya are feared to be driving a sharp rise in elephant poaching which has seen dozens of animals slaughtered this year. In the first eight months of 2008, 57 carcasses have been found across Kenya with their tusks hacked out, 15% more than the total for all of 2007, and the third annual increase in a row. More than half of the elephants were killed in an area where Chinese construction crews have recently arrived to tarmac hundreds of miles of gravel tracks.

At the same time, wildlife officials report that the majority of ivory smugglers arrested at Jomo Kenyatta International Airport in Nairobi are now Chinese nationals, some of them carrying up to 110kg [~243 lbs.] of raw or carved tusks.

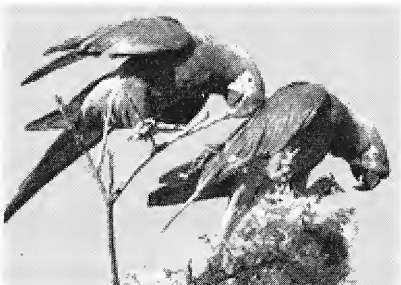


majority are hidden on trucks heading to Ethiopia where controls are more lax, but where there are regular passenger and cargo flights to the Far East.

Kenyan wildlife officials place much of the blame for the surge in poaching on the Convention on International Trade in Endangered Species (CITES) which in July allowed Botswana, South Africa, and Namibia to sell a total of 108 tons of ivory to China and Japan. This has revived a market which until then had been starved of supply after a 19-year blanket ban on the sale of ivory, broken only in 1999 for an earlier one-off sale of 50 tons to Japan.



“The poachers in the bush, they got the wrong message from that decision,” said Robert Myasya, assistant director of security for the Kenyan Wildlife Service who leads the airport arrest teams. At least eight Chinese nationals have been arrested and charged with smuggling ivory in the last 12 months. *Source: Archer's Post/Mike Pflanz 10/04/08 Photos: Courtesy of Kenyan Wildlife Service*



New Ban Targets Illegal Mexican Parrot Trade - A new permanent ban on parrot sales in Mexico may protect the country's exotic birds from a thriving illegal wildlife trade. Mexico considers half of its 22 parrot species endangered, and all but two are protected by federal law.

But between 65,000 and 78,000 parrots and guacamayas are captured illegally every year, and most of these birds die each year before reaching their intended buyers.

The government has been unable to control the clandestine capture and sale of the protected birds say environmentalists. The new ban - an amendment to Mexico's wildlife laws - will hopefully eliminate the parrot and guacamaya market completely. The new ban was scheduled to go in effect at the end of October--time will tell whether its enforcement will be effective.

The Defenders of Wildlife Mexico's report on the illegal trade identified U.S. demand as a major driving force behind the smuggling operations. Mexico only allows the sale of parrots via legal channels, such as through a federally established conservation area or the regulated estates of bird trapper and export unions. Between 3,000 and 4,000 parrots are allowed for capture each year, according to government quotas. *Source: National Geographic News 10/02/08*

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